The RUBBER AGE

March, 1943

DISPERSED TYSONITE

Dispersed **TYSONITE** is being used in many places where latex and dispersed reclaim have been used. It is moderately stable and can be coagulated and the same precautions used for rubber dispersions should be followed in handling. It may be compounded with various materials to produce different properties and characteristics.

DISPERSED TYSONITE

is suggested for:

Upholstery and rug backing

Coating of paper and fabric

Saturation of paper & other fibers

Dispersed **TYSONITE** is shipped in 55-gallon drums. Samples & technical assistance available.

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York City

Newsletter No. 3
MARCH, 1943

Published by Rubber Chemicals Division of DU PONT

RECLAIMED RUBBER-NEOPRENE BLENDS HELP CONSERVE NEOPRENE

AT THIS TIME an important contribution to the rubber program is the conservation of neoprene. Every pound of neoprene that is wasted means an unnecessary drain on the rubber stock pile—for today neoprene is replacing rubber in many products for the sole purpose of making the rubber stock pile last longer. More and more products which do not require exceptional physical properties are being made of neoprene. Technicians are developing adequate neoprene compounds and saving neoprene by incorporating more fillers, by using extenders and by blending with reclaimed rubber. These compounds do not conform to the uniformly high standard of performance which has been established by past experience, but they are *adequate* for the job they are required to perform, and in many cases superior to a similar rubber product.

Compounds suitable for use in the manufacture of many mechanical goods have been developed by utilizing blends of neoprene and reclaimed rubber. The vulcanizates of properly compounded blends have comparable stress-strain properties to those containing rubber and reclaim mixtures. Naturally, they do not have the outstanding resistance to oils, solvents, heat, sunlight and to chemicals which characterize the neoprene compounds we have recommended in the past, but they are superior in these properties to many of the rubber compounds they will replace.

COMPOUNDING— Reclaimed rubber and neoprene are compatible in all proportions. Two principal methods of accelerating these blends may be satisfactorily used.

1. The safest processing stocks contain from one to three per cent of a thiazole accelerator based on the total hydrocarbon present. The function of the thiazole is twofold since it apparently retards vulcanization of the neoprene phase while accelerating the rubber phase. Tests indicate that MBTS is the most effective thiazole for this purpose. No sulfur should be used as amounts as low as 0.25 per cent make the stock quite scorchy. Neutral reclaims are less objectionable than are alkali reclaims in this respect. Further, the inclusion of sulfur does not enhance the properties of the blends appreciably regardless of the type of reclaim used.
2. Sulfur may be used with Thionex acceleration to produce fast-curing stocks. However, this type of acceleration is more scorchy than the MBTS acceleration and should generally be used only when processing conditions can be carefully controlled.

Physical test data, comparing the properties of a stock made from a neoprene-reclaimed rubber blend with those of stocks in which the elastomer content is present as neoprene, as crude rubber, and as mixtures of crude rubber and reclaimed rubber, are shown in the accompanying table. An alkali type whole tire reclaim was used and all stocks are loaded with soft carbon black.

The use of neoprene in conjunction with reclaimed rubber is discussed more fully in a report covering work conducted by a number of rubber reclaim suppliers in cooperation with the du Pont Rubber Laboratory. Copies of this report are available to all interested rubber manufacturers. Just drop us a line on your company letterhead requesting a copy of "Compounding Principles for Neoprene—Reclaimed Rubber Mixtures."

COMPARISON OF NEOPRENE, RUBBER, NEOPRENE-RECLAIMED RUBBER AND CRUDE-RECLAIM RUBBER BLENDS

	STOCK NUMBER			
% by Volume	A	B	C	D
Neoprene.....	—	—	58	29
Crude Rubber...	58	29	—	—
Reclaimed Rubber Hydrocarbon	—	29	—	29
Total Elastomer.	58	58	58	58
Physical Properties at Optimum Cure				
Modulus at 300%	1425	1100	1300	950
Tensile Strength —psi.....	2125	1400	1650	1200
Elongation at Break—%....	475	415	485	480
Hardness (Shore)	54	61	62	56
Cure at 289°F.—Minutes.....	10	10	40	60
Scorch Test—Cure 60'/227°F.				
Tensile Strength —psi.....	475	775	150	125

Through the mill

Neoprene latex compounds *designed for the production of a number of different types of articles are presented in a series of bulletins recently prepared. The reports contain practical and specific information regarding the compounds and description of the methods, especially variations from the standard method, by which the products may be made. The products covered include neoprene latex thread, jacketing of wires from neoprene latex, meteorological balloons, neoprene latex on pile fabrics, neoprene latex proofed goods, surgeons gloves, heavy industrial gloves and light industrial gloves, and the coating of metal articles with neoprene from latex.*

The critical situation *regarding supplies of toluene has made it necessary for the War Production Board to restrict the use of formaldehyde-para-toluidine (Accelerator No. 8) to those products in which no other accelerator or accelerator combination can be employed to as good advantage and which products in turn play an important part in the war effort. We are advised now that it will be necessary to furnish a priority of AA-3 or better with all orders for formaldehyde-para-toluidine.*

Plasticizers *for use in Neoprene Type FR, GN and ILS compounds are evaluated in a recent report which will be sent to manufacturers of rubber goods. In the report particular attention has been paid to the effect of softeners on the heat and freeze resisting properties of the compositions.*

The use of THERMOFLEX A and NEOZONE A *in reclaimed tread stocks is covered in a recent report. The data should prove of interest wherever all reclaimed stocks are used under dynamic conditions, for example, in shock absorbers, tire carcasses, etc.*

DU PONT

RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . Through Chemistry

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year. Canada, $3.50; Foreign, $4.00. March, 1943. Vol. 52, No. 6.

GASOLINE RESISTANCE—

another great advantage of certain SYNTHETIC RUBBERS

IT'S synthetic rubber that makes the bullet-sealing fuel tank a practical, hard-working reality, already credited with bringing back many planes and many more men who otherwise almost certainly would have been lost.

As most aviation people know, the principle of the self-sealing fuel tank is simple enough: An inner lining of gasoline-resistant synthetic, an intermediate layer of non-resistant rubber, and a cover of rubber and fabric. When pierced by a bullet, gasoline leaks through the hole in the synthetic liner, attacks the non-resistant intermediate layer, which swells and closes the puncture, enabling the plane to return to base for repairs.

In bullet-sealing tanks, fuel hose, oil hose, gaskets, hydraulic seals and hundreds of other essential uses, Hycar is performing with the dependability that over 16 years of pioneer development work have put into it.

The same "know-how" that made possible the high gasoline-resistance to this type of synthetic rubber is also supplying rubber fabricators with other types for a wide variety of approved applications.

Further, that "know-how" will be ready, when the war is won, to offer the special, custom-tailored rubbers that will make possible the totally new and vastly better products with which this country must win the peace. *Hycar Chemical Co., Akron, Ohio.*

HYCAR

LARGEST INDEPENDENT PRODUCER IN AMERICA OF BUTADIENE SYNTHETIC RUBBER

Synflex

SYNTHETIC VINYL RESINS

Compounded Ready for Use

— Now being successfully used to replace rubber for coating fabrics to meet U. S. specifications for Raincoats, Hospital Sheeting, Food Bags, Jungle Hammocks, etc. . . .

★

"Synflex" Synthetic Resins are available in two forms:

1. SPREADER SOLUTION for use with Spreader Equipment;
2. CALENDER COMPOUND for use with Calenders.

Both forms are already compounded—ready for use. They are low in cost and far more economical than mixing your own materials.

We are in a position to furnish Technical Experts who can help run material in your plant. Send for samples and complete data today.

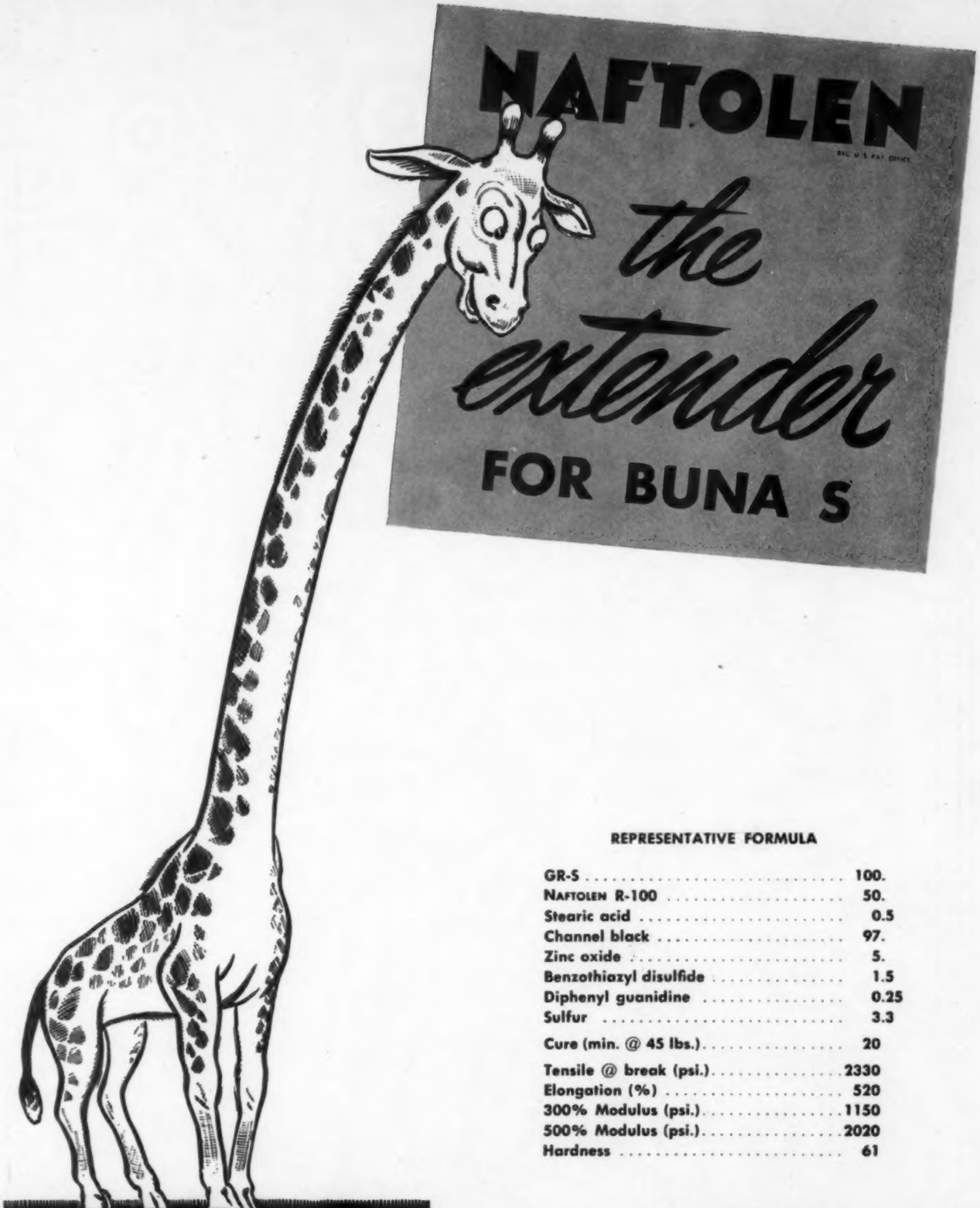
★

Gordon-Lacey CHEMICAL PRODUCTS CO.

57-02 48th STREET

MASPETH, L. I. — NEW YORK CITY

In Canada: 1 Van Horne Ave., Montreal



REPRESENTATIVE FORMULA

GR-S	100.
NAFTOLEN R-100	50.
Stearic acid	0.5
Channel black	97.
Zinc oxide	5.
Benzothiazyl disulfide	1.5
Diphenyl guanidine	0.25
Sulfur	3.3
Cure (min. @ 45 lbs.)	20
Tensile @ break (psi.)	2330
Elongation (%)	520
300% Modulus (psi.)	1150
500% Modulus (psi.)	2020
Hardness	61

Extend your synthetic rubber supplies by the use of 25 to 100 parts of NAFTOLEN on 100 parts of Buna S, employing 2% sulfur on the Buna S and 2 to 3% sulfur on the NAFTOLEN. For optimum properties NAFTOLEN requires 100% carbon black in addition to that normally used for the Buna S.

WILMINGTON CHEMICAL CORPORATION
10 East 40th Street · New York, N. Y.
Plant and Laboratory: Wilmington, Delaware

You Can't Specify Ability

When you place an order for a particular type of zinc oxide, the most important part of your specification is that which no specification could possibly contain—namely, the ability of the producer *to live up to it.*

We have yet to meet a problem involving the use of zinc oxides which hasn't been solved to the consumer's complete satisfaction from the standpoint of both quality and uniformity. This is due to the fact that ST. JOE Lead-Free ZINC OXIDES are produced direct from ore by a patented electro-thermic process, which enables us to exercise a degree of product-control unattainable by any other means of production.

ST. JOSEPH LEAD COMPANY

250 PARK AVE., NEW YORK, N. Y.

MADE BY THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

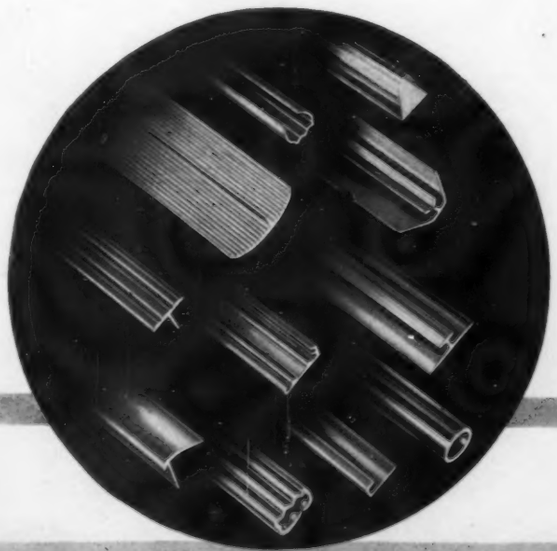
MACHINES FOR PLASTICS EXTRUSION

should be built for the job

SINCE each different plastic has a characteristic behavior, its proper extrusion requires a *machine built for the job.*

National Rubber Machinery Company has recognized this fact by the establishment of a *Plastics Division,* staffed with engineers and chemists who are constantly working with war manufacturers and others in the development of machines for their particular needs. These men know that almost any thermoplastic material can be extruded, provided proper equipment and technique are employed. They have proved it by actual trial runs in National's modern Pilot Plant.

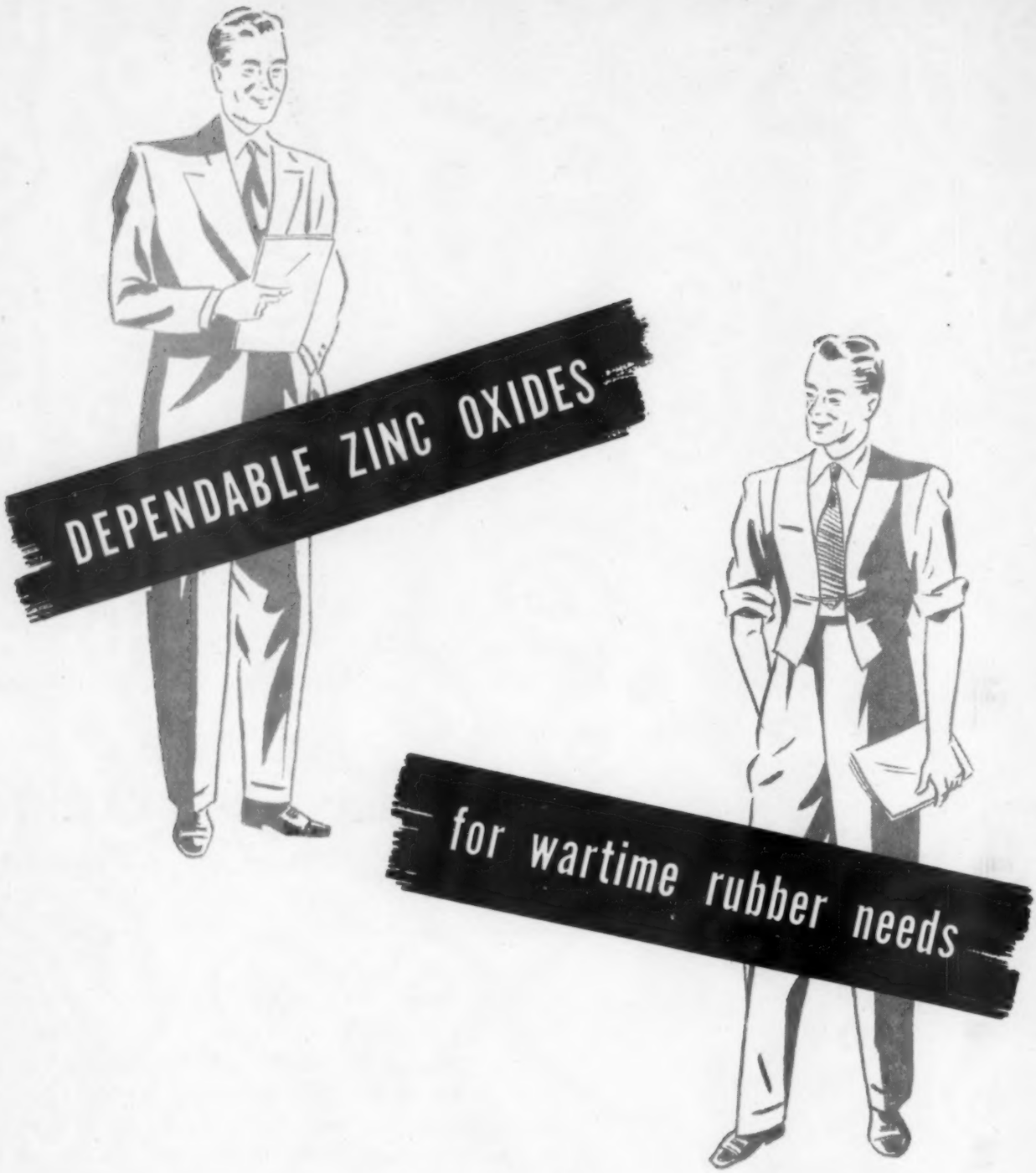
This policy, combined with the wide experience developed in building extruders for the rubber industry, has helped to sell more National plastics extruding machines than all other makes combined.



NATIONAL RUBBER MACHINERY COMPANY

General Offices: Akron, Ohio

CREATIVE ENGINEERING

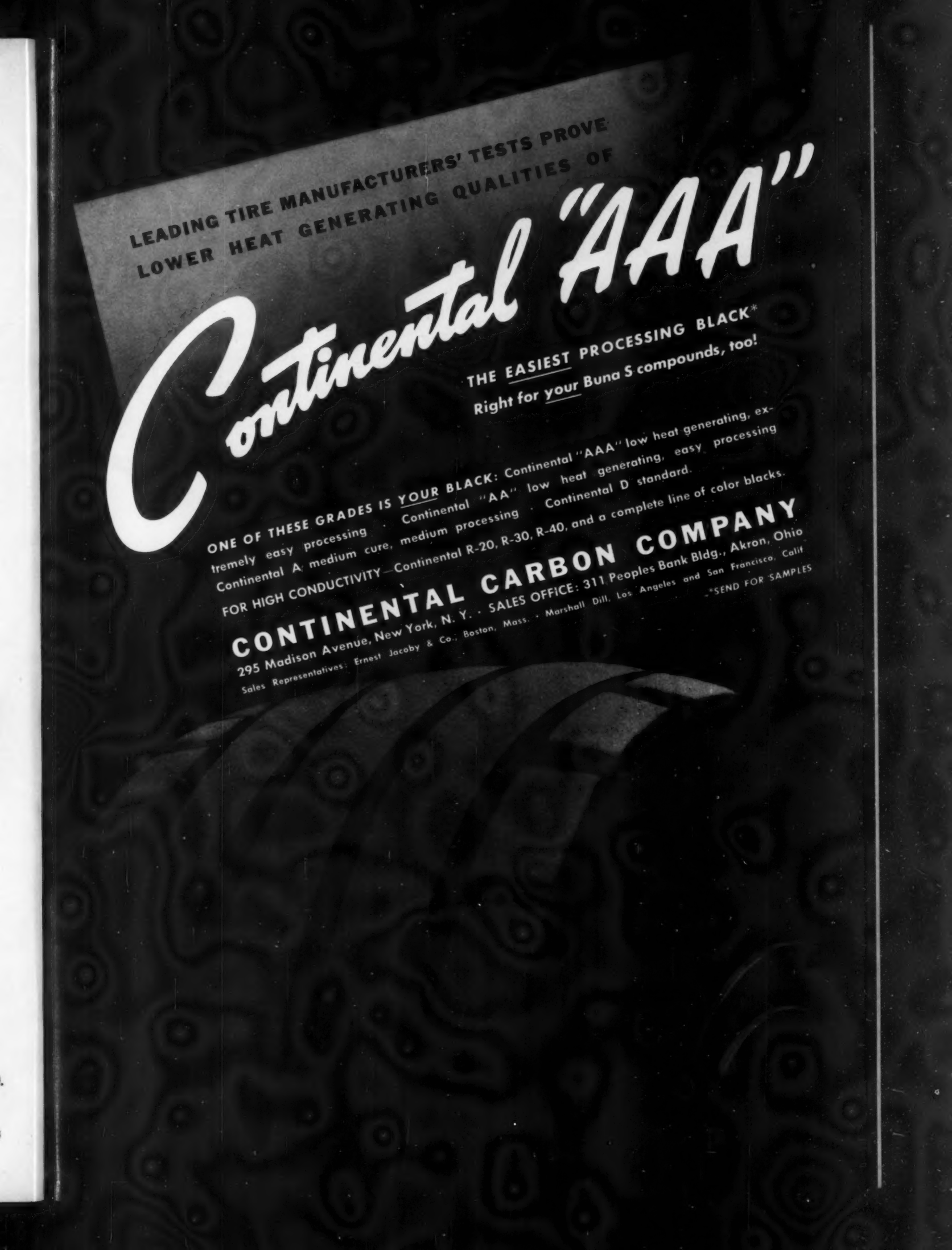


AZO

ZINC OXIDES

AMERICAN ZINC SALES CO., Distributors for AMERICAN ZINC, LEAD & SMELTING CO.

COLUMBUS, OHIO - CHICAGO - ST. LOUIS - NEW YORK


LEADING TIRE MANUFACTURERS' TESTS PROVE
LOWER HEAT GENERATING QUALITIES OF
Continental "AAA"
THE EASIEST PROCESSING BLACK*
Right for your Buna S compounds, too!
ONE OF THESE GRADES IS YOUR BLACK: Continental "AAA" low heat generating, extremely easy processing . Continental "AA" low heat generating, easy processing Continental A medium cure, medium processing . Continental D standard.
FOR HIGH CONDUCTIVITY—Continental R-20, R-30, R-40, and a complete line of color blacks.
CONTINENTAL CARBON COMPANY
295 Madison Avenue, New York, N. Y. . SALES OFFICE: 311 Peoples Bank Bldg., Akron, Ohio
Sales Representatives: Ernest Jacoby & Co., Boston, Mass. . Marshall Dill, Los Angeles and San Francisco, Calif
*SEND FOR SAMPLES

Thiokol*

Synthetic Rubbers and Rubber Chemicals

Sold by Thiokol Corporation

CRUDES:

TYPE A—for stocks requiring unsurpassed solvent resistance.

TYPE FA—for stocks that must withstand aromatic blended fuels.

TYPE RD—for stocks requiring properties of buna types.

WATER DISPERSIONS:

TYPE MF—for producing tough oil-resistant coatings without vulcanizing and able to withstand low temperatures.

TYPE S104—for producing odorless, oil-resisting coatings.

TYPE MX—for producing oil-resisting coatings without vulcanizing and producing good adhesion to other surfaces.

PLASTICIZERS & EXTENDERS:

TP-10—for softening cured Thiokol synthetic rubber and buna rubber.

TP-90—for Thiokol synthetic rubbers and buna types to withstand low temperatures.

FALKOMER—an extender for buna type synthetic rubbers.

MOLDING POWDERS:

No. 472—for molding oil-resisting elastic type products in plastic molding equipment.

No. 1001—for molding oil-resisting, hard rubber type products in plastic molding equipment.

VULCANIZING AGENT: VA1—for use in buna S.

*Thiokol Corporation Trade Mark, Reg. U. S. Pat. Off.

THIOKOL CORPORATION

TRENTON, NEW JERSEY

Does Your Plasticizer Combine all These?

PICCOCIZER "30"

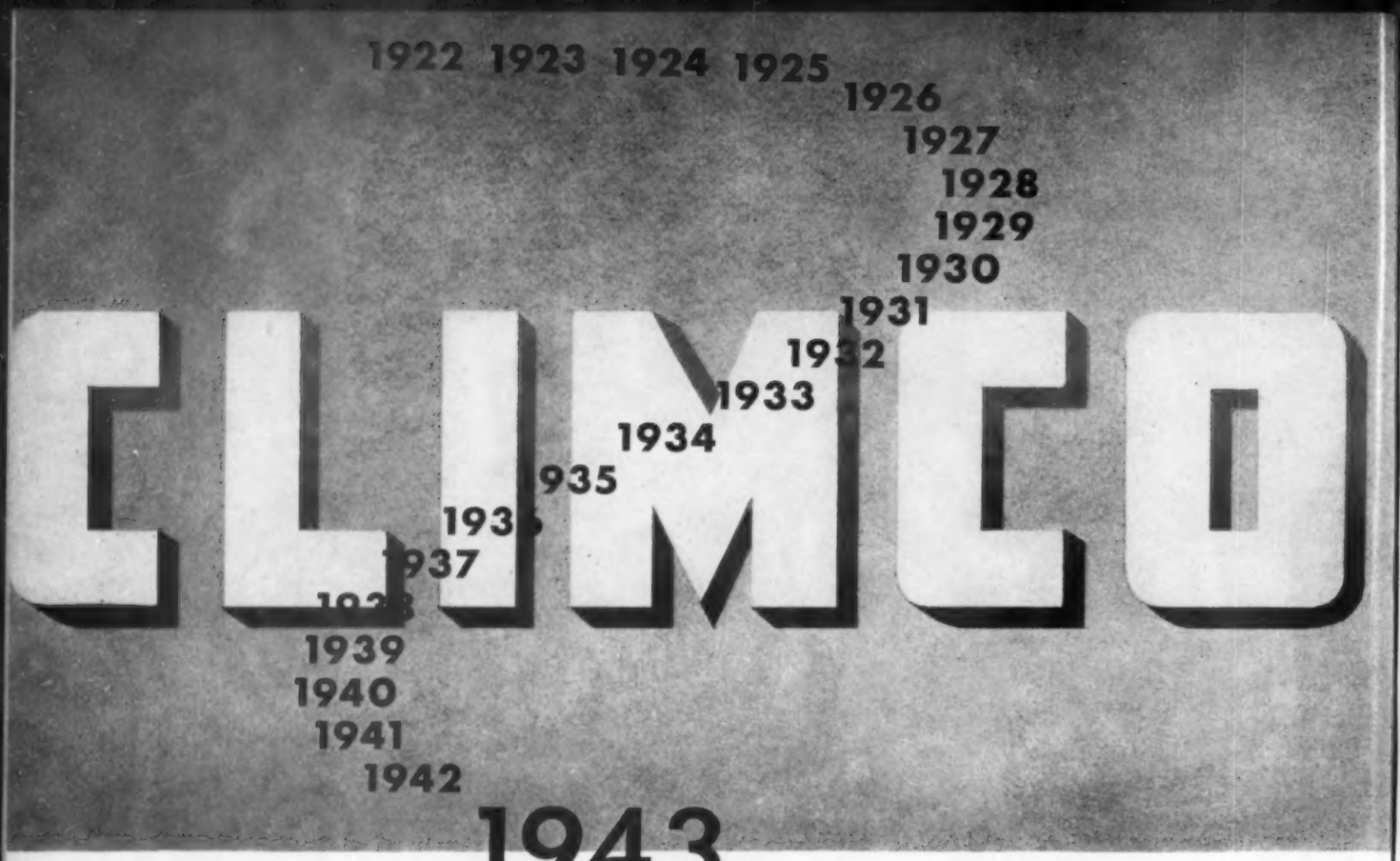
- Low Temp. Flexibility
- Low Heat Loss
- Excellent Plasticizing
- Quick Incorporation
- Good Tensile Strength
- Low Plasticizer Extraction
- LOW COST . . .

It is to your advantage to investigate the many possibilities of this all-purpose plasticizer. It is a high boiling polymerized aromatic oil tested to *Precision* standards . . . Its remarkable combination of properties definitely meet many problems in today's Synthetic compounding . . . Write or wire at once for samples and full data.

STANDARD

Chemical Company

AKRON SAVINGS AND LOAN BLDG. AKRON, OHIO



THE LEADING PROCESSED LINER FOR OVER 22 YEARS

CLIMCO Processing has stood the test of time and many changes in the rubber industry. Soon after its introduction in 1922 the Climco treatment was acknowledged as the best method of processing liners. Today it is still unrivaled in popularity.

Climco's success is not difficult to explain. This tough, flexible glaze applied to the liner guarantees better separation and banishes stock adhesions. Thus it saves: (1) repairs due to sticking and tearing, (2) constant cleaning between trips to the calender, (3) rerolling for cooling. Climco reduces labor and power costs, and also lengthens the life of the liner.

Today you can't afford to take a chance with your liners. Protect them with processing of *proven* quality. Have your liners "Climcoed."

THE CLEVELAND LINER & MFG. CO.
CLEVELAND, OHIO

LINERETTE
INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO PROCESSED LINERS

FOR FASTER, BETTER PRODUCTION AT LOWER COST

VICTORY

Requires EFFICIENCY in Plant Operation and ECONOMY in Vital Materials . . . .

Both of these objects are easily attained in a rubber factory by the use of *Capitol Process Liner Treatment.*

Plant operation is more efficient when liners are made repellent to rubber stocks enabling operators to handle stocks more quickly and effectively.

Economy in the use of rubber—one of today's most vital materials—is also obtained with CAPITOL Liners because waste of compounded stock is reduced to a minimum.

If you have not as yet accepted our offer to treat, without charge, a sample of your liner, send us 50 or 100 yards and we'll process and return it to you ready to test in your own plant.

TEXTILE PROOFERS, INC.

ONE GATES AVENUE

JERSEY CITY, N. J.

Originators of the Capitol Process Liner Treatment

Outstanding NEW USE

for a LONG-ESTABLISHED PRODUCT

AC

PARRAS

Washed and Dried

GUAYULE

TACKIFIER and EXTENDER for

BUNA S

DISTRIBUTED BY

RUBBER RESERVE COMPANY

•

AMERICAN CYANAMID

& CHEMICAL CORPORATION

A UNIT OF AMERICAN CYANAMID COMPANY

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

REPRESENTATIVES OF CIA HULERA DE PARRAS, S. A., MEXICO, PRODUCER

No Dimout
FOR
TITANOX PIGMENTS

It is not by chance that TITANOX is the dominating name among opaque white pigments employed in the Rubber Industry. By making TITANOX pigments the finest white pigments that science and skill can create, their producers have made sure of their leadership.

Thus TITANOX pigments give new meaning to whiteness and brightness, high tinting strength and color stability.

Just as TITANOX pigments give unexcelled whiteness and brightness to natural rubber, so they give these qualities to reclaimed and synthetic rubber in the highest degree.

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
111 Broadway, New York, N. Y. • 104 South Michigan Ave., Chicago, Illinois • 350 Townsend St., San Francisco, California • 2472 Enterprise St., Los Angeles, California

TITANOX
TRADE MARK

BARRETT CHEMICALS FOR INDUSTRY

RUBBER COMPOUNDING MATERIALS

CARBONEX*—A black coal-tar hydrocarbon, in flake form, that carries a high content (40% minimum) of free carbon in finely dispersed form.

CARBONEX S*—Carbonex modified with 5% of available stearic acid for greater ease of milling into plantation or reclaimed rubber.

CARBONEX S PLASTIC*—A plastic form of Carbonex S melting between 175 and 185° F., which may be dispersed in all reclaim rubber compounds on open mills.

PLASTENDER*—A hydrocarbon product in flake form which carries a minimum of 22% free carbon in finely dispersed form.

PLASTENDER S*—Plastender modified with 5% stearic acid for greater ease of milling in plantation or reclaim rubber.

PLASTENDER SD*—This lowest melting of the Plastenders may be dispersed in all reclaim compounds on open mills.

CUMAR*—Paracoumarone-Indene Resin available in grades varying in melting point from 10° C. to 150° C. These are dependable compounding agents for rubber compounds of almost every type.

BARDOL*—A refined coal-tar distillate whose high content of aromatic hydrocarbons makes it an exceptional softener for rubber and an agent for dispersing pigments and fillers into compounds of natural or synthetic rubber.

BARDOL B*—A pale yellow to straw-colored coal-tar oil which is especially valuable as a softener for synthetic rubbers.

DISPERSING OIL No. 10—A medium-boiling oil distilling between about 225-300° C., which has good dispersing and plasticizing properties. Lower viscosity, lighter color, lower gravity than B.R.V. or S.R.O.

B.R.H. No. 2*—A semi-liquid black asphaltic product used as a rubber tackifier.

B.R.T. No. 3*—A heavy dark viscous liquid used as a saturant for fabric or woven brake linings.

B.R.T. No. 7*—A refined tar used as a rubber softener and as a wetting and softening agent in black, synthetic compounds.

B.R.V.*—A dark coal-tar oil of high-boiling range used in rubber reclaiming operations.

S.R.O.—A high-boiling, non-saponifiable oil with high penetrating qualities desirable in reclaiming operations.

RECLAIMING OIL No. 1621—A yellow or amber oil used in rubber reclaiming in both the digester and pan methods.

B.R.C. No. 20*—A solid coal-tar hydrocarbon used in rubber compounds for mechanical rubber goods to promote good working characteristics.

RESIN-C-PITCH*—A solid coal-tar derivative of value as a reinforcing softener in hard rubber compounds.

Wire or write for complete descriptions and suggested applications.

*Trade-mark Reg. U. S. Pat. Off.

ARMY E NAVY

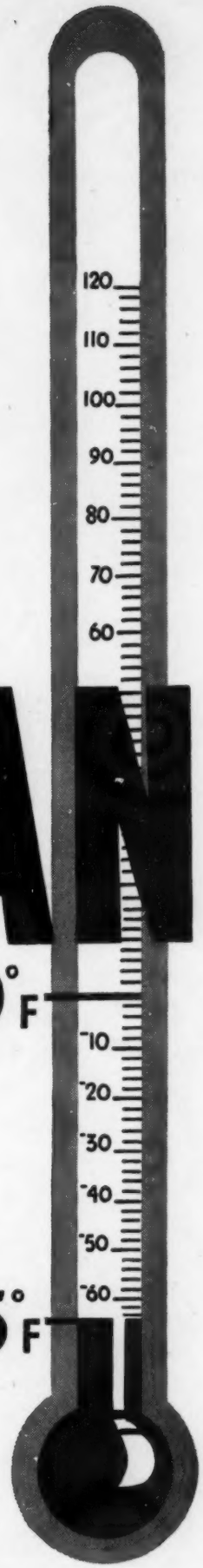
THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK

Barrett

One of America's Great Basic Businesses

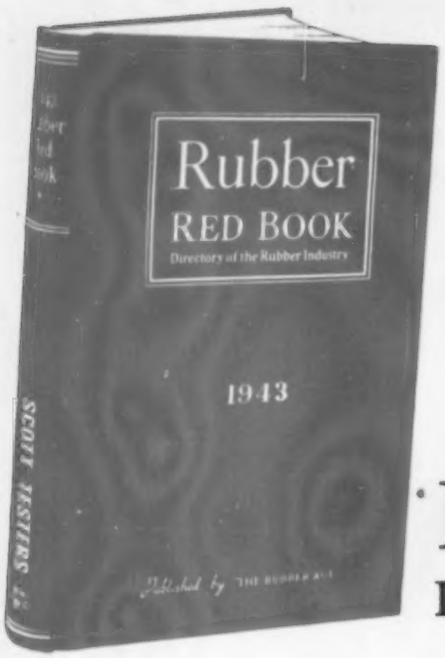
The outstanding oil-resistant Synthetic Rubber . . . for extreme

COLD PERBUNAN



Write **STANCO DISTRIBUTORS, INC.**
26 Broadway, New York City
•
Warehouse stocks in New Jersey
Louisiana and California
•

PERBUNAN
REG. U. S. PAT. OFF.



Closing Date for Advertising Copy

APRIL 30

for the 1943

Rubber Red Book

Directory of the Rubber Industry

This timely edition, reflecting all war-time developments of the rubber industry, is the logical medium for keeping your customers and prospects posted on your products, facilities and services for current and post-war needs!

1943 Edition Scheduled for May

● Over 100 leading concerns serving the rubber industry have ordered space in this edition. Some of the former advertisers have doubled or tripled their space and included also are a considerable number of new advertisers not heretofore represented in this directory. The cream of the suppliers of rubber machinery, chemicals and other materials will be represented.

If you have not already sent in your order, may we suggest that you do so today? Advertising rates in brief are included in the accompanying box but if you want complete details, they will be sent on request.

Cost of Space

Page	$75
Half Page	40
Quarter Page	25

Size of Spaces

Page	4½" x 7¼"
Half	4½" x 3½" or 2⅛" x 7¼"
Quarter	4½" x 1⅝" or 2⅛" x 3½"

★

THE RUBBER AGE

250 West 57th St., New York City

DIXIEDENSED KOSMOBILE

UNITED CARBON COMPANY · CHARLESTON, WEST VIRGINIA

DIXIEDENSED AND KOSMOBILE, THE "QUALITY TWINS"

OF THE RUBBER INDUSTRY, PRODUCE PRODUCTS THAT

ARE WELL PREPARED FOR THE STRAIN OF TOMORROW.

"I'm going to shock you!"

"Because I'm going to hit right from the shoulder, starting now.

"Out there, our boys are fighting, and they're falling. Not one or two at a time, picked off by a nice clean bullet. But fifty at a time in the roaring, flaming hell of a shell burst.

"Out there, they aren't walking around in clean white uniforms on neat decks. They're running and slipping around on the bloody heaving flanks of a carrier foundering in a sea of oil with her guts torn out.

"They're not lying in cool, immaculate hospital beds with pretty nurses to hold their hands. They're flat on their backs on cold steel taking a smoke and waiting for a doctor to get through with the *seriously* wounded.

"Out there, they're fighting and they're falling but they're winning! And get this straight—they're not complaining. But I want you to know what they're up against. I want you to know they look to you to give them in *your* way the same full measure of help and devotion they get unasked from their own shipmates.

"And you *can* help them—by giving generously to the Red Cross.

"If you had seen the faces of men pulled naked from the sea as they received kit bags and cigarettes handed out on the spot by Red Cross Field Directors—you'd know what I mean!"

* * *

On every front the Red Cross presses forward. Each day, the need increases for your support.

Your Chapter is raising its Second War Fund in March. Give more this year—give double if you can.

THE RECORD SINCE PEARL HARBOR

For the Armed Forces—More than one million and a half service men have received, through the Field Staff, practical help in personal problems. The Red Cross is with them in training and at the front. For morale and recreation, over one hundred Red Cross Clubs have been established for overseas troops. There are more than five thousand workers in the field.

Civilian Relief—About sixty million dollars in war relief has been administered in every allied country. Food, clothing, medicinal supplies have gone to Great Britain, Russia, China, Africa, for Polish and Greek refugees, and many others.

Thousands of packages to prisoners of war have been safely delivered through cooperation with the International Red Cross in Switzerland.

The Home Front—Training our people to meet the needs of war. Millions of First Aid Courses. Hundreds of thousands trained in Home Nursing and Nutrition Courses. Thousands enlisted as Nurses' Aides and in Motor and Canteen and Staff Assistant Corps.

More than one million and a half blood donations through Red Cross collection centers and the distribution of the life saving Plasma wherever needed.

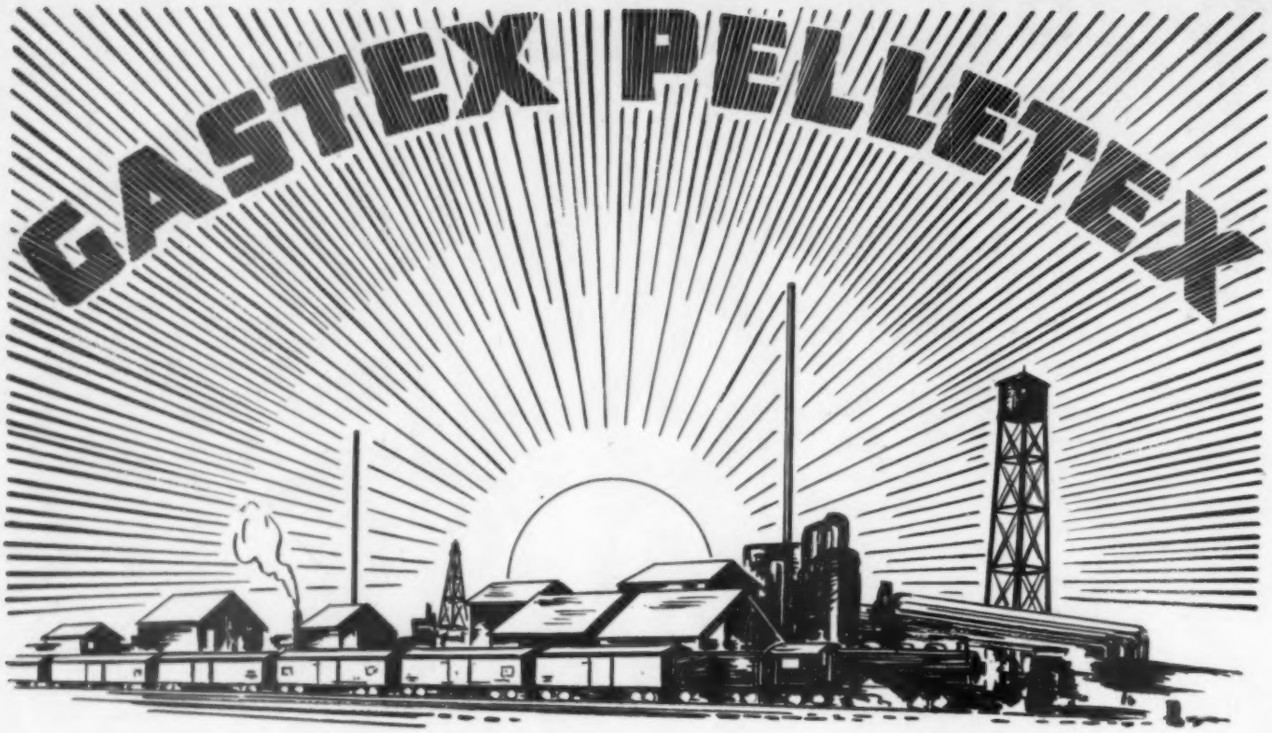
Chapter Production rooms from coast-to-coast providing surgical dressings for the wounded, kit bags for the fighters and tons of clothing for relief.

The Red Cross record in this war is one that we Americans may well be proud of—and support.

Your Dollars help ✚ make possible the

AMERICAN ✚ RED CROSS

This space contributed by the Publisher



When the New Day Dawns

Unless you have a WPB allotment you may miss that carload of GASTEX or PELLETEX that used to arrive so regularly at your siding. Our whole output, in greatly increased volume, is today serving you by serving our country. Soldiers' boots, truck, jeep and airplane tires, signal corps wire, motor mountings. —and a thousand other items of war are rendering better service because the rubber or synthetic compound is re-enforced with GASTEX or PELLETEX.

Men of vision are exploring *now* in research laboratories the new fields of usefulness for rubber and synthetic compounds to be developed after peace. In your post-war planning don't overlook the enormous range of applications for which Gastex and Pelletex are well suited. Be ready when the great day comes.

We invite your inquiries

HERRON BROS. & MEYER

OHIO BLDG., AKRON, OHIO.

GENERAL SALES AGENTS FOR

GENERAL ATLAS CARBON DIVISION

OF GENERAL PROPERTIES COMPANY, INC.

PAMPA, TEXAS — GUYMON, OKLA.

GASTEX TRADE MARK

PELLETEX TRADE MARK

DISTRICT SALES AGENTS

ERNEST JACOBY & CO., Boston
HERRON BROS. & MEYER, New York
THE C. P. HALL CO. OF CALIF., Los Angeles
HERRON & MEYER, Chicago
H. M. ROYAL, INC., Trenton, N. J.
ST. LAWRENCE CHEMICAL CO., LTD., Toronto - Montreal

KEEP EXTRUDERS *in the FIGHT!*

Proper Lubrication Pays!

The obligation for servicing Royle extruders is shared between Royle and our grand customers. Our 100% War production precludes the intimate touch with customers we at Royle covet. Thus, we must pass along to you the task of guarding your producing extruders against faulty lubrication.

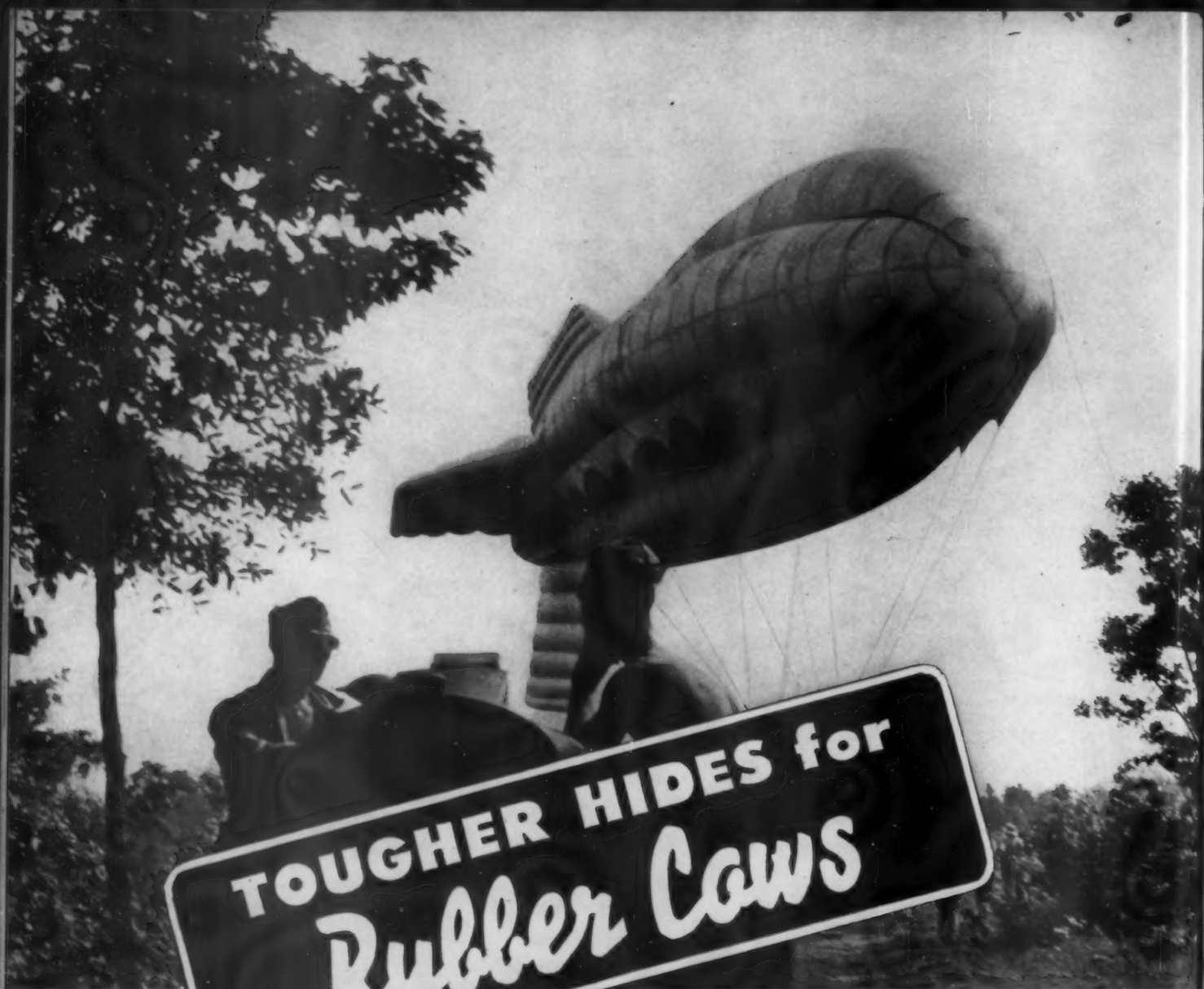
Your machines are running at 24 hour top speed. Please keep them properly lubricated. If in doubt as to the proper lubrication policy to follow, write us. Send size, type (marine, ball or roller thrust bearing . . . spur, worm or herringbone gears).

Believe us, we want to keep you running!

JOHN ROYLE & SONS

PATERSON, N. J.

AKRON: J. C. CLINEFELTER **LONDON: JAMES DAY (MACHINERY) LTD.**



SUN RUBBER PROCESSING OIL

Lengthens Life of Synthetic Rubber Barrage Balloons

A barrage balloon has to be tough to live through the beating it takes. Wind, rain, sleet, sun, cold and heat . . . combined with the stresses of pull, twist, tear and shock . . . add up to just about the most gruelling test to which synthetic rubber has ever been subjected. The synthetic rubber manufacturers have done an outstanding job in producing "rubber cows" that can "take it."

Many of the leading rubber manufacturers have found in Sun Circo Light Processing Oil a plasticizer which is highly compatible with most compounds and which helps to obtain the flexibility and toughness required to meet Government specifications. Circo Light Processing Oil has also stepped up production speed and decreased costs by reducing milling time and increasing the percentage of inert material.

A Sun "Doctor of Industry" will be glad to discuss your wartime compounding problems and submit specific recommendations for their solution. You will probably find that Circo Light Processing Oil can help to improve your production just as definitely as it has helped many other processors of natural, synthetic and reclaimed rubber. Write

SUN OIL COMPANY, *Philadelphia*

Sun Oil Company, Limited, Toronto, Canada

SUNOCO

SUN PETROLEUM PRODUCTS *HELPING INDUSTRY HELP AMERICA*

The RUBBER AGE

One of the World's Outstanding Rubber Journals

M. E. LERNER
Editor
LOIS HOPKINS
Production Manager
HARRIET K. COLE
Circulation Manager
PETER P. PINTO
General Manager

VOLUME 52
NUMBER 6

CONTENTS FOR MARCH, 1943

Rubber Substitutes from Fatty Oils—*By Ralph T. Nazzaro and William Abramowitz* 483

Progress Report No. 2 of the Office of the Rubber Director 487

Densities of Synthetic Rubbers 494

Kaumagraph Dry Transfers 494

Influence of Tension on Belting 494

Bell Telephone's Rubber Research Laboratory—*By F. S. Malm* 495

Plastac—A Processing Aid for Butadiene-Type Rubbers.. 498

Division of Rubber Chemistry to Meet in Detroit, Mich., on April 15 and 16 499

•

REGULAR DEPARTMENTS

New Equipment Section ...	524	Obituaries	522
Book Reviews	530	Los Angeles News	520
Editorial	503	Washington Who's Who	516
Late Domestic News	504	Rubber, Cotton Markets	538
Financial News	518	Chemical Markets	539
Names in the News	521	Market Place	540
Coming Events	511	Classified Ads	545

•

Published on the 15th of each month by

PALMERTON PUBLISHING COMPANY, INC

Printing office,
East Stroudsburg, Pa.

Editorial and Advertising Offices
250 West 57th St., New York City

New England Representative—F. ROYAL CAREY, P.O. Box 133, Providence, R. I.
Western Representative—IRVING V. KOCH, 64 East Lake St., Chicago, Ill.

Entered as Second Class Matter, October 20, 1933 at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $3.00 a year; Canada, $3.50; Foreign, $4.00. Single copies up to 3 months old, 35 cents; over 3 months old, 50 cents. Telephone COlumbus 5-2923, 5-2924.

Contents Copyrighted 1943 by the Palmerton Publishing Company, Inc.

Indexed in Industrial Arts Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

Also Publishers of:

RUBBER RED BOOK
Directory of the Rubber Industry
Published Biennially

ANNUAL BIBLIOGRAPHIES OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D.
First issue covers year 1935

LATEX IN INDUSTRY
By Royce J. Noble, Ph. D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932 to January 1937; rubber derivatives to January, 1937.

GUARANTEE YOUR RUBBER OR RECLAIM PRODUCTS

by using

BLE AND BLE POWDER

Naugatuck Antioxidants

for

- RESISTANCE TO HEAT AND OXIDATION
- EASE OF DISPERSION AND PROCESSING
- RESISTANCE TO FLEX-CRACKING
- RESISTANCE TO COPPER CONTAMINATION

in

TIRES . . . HEELS AND SOLES . . . CAMELBACK
BELT COVERS . . . FOOTWEAR . . . CLOTHING
WIRE INSULATION.

PROCESS-ACCELERATE-PROTECT with Naugatuck Chemicals

Naugatuck Chemical

DIVISION OF UNITED STATES RUBBER COMPANY
ROCKEFELLER CENTER NEW YORK, N. Y.

IN CANADA: *Naugatuck Chemicals Limited, Elmira, Ont.*

The **RUBBER AGE**

VOL. 52, No. 6 **MARCH, 1943**

Rubber Substitutes from Fatty Oils

By RALPH T. NAZZARO AND WILLIAM ABRAMOWITZ

American Resinous Chemicals Corp., Peabody, Mass.

IT has long been known that spongy, rubber-like materials can be produced by the reaction of fatty oils with sulfur or sulfur chloride. However, the products, although actually termed "rubber subs," are only superficially rubber-like. In essence, they are brittle, crumbly, possessed of little tensile strength and less elongation. Their major use has been as extenders or modifiers for crude or reclaimed rubber. However, since the United States has an abundance of fatty oils —our annual peacetime consumption being of the order of 120,000,000 tons—it was natural that this tremendous source of raw materials become the subject of extensive research.

The U. S. Department of Agriculture recognized at an early date the importance of fatty oils and sponsored an extensive research program on this subject in its Northern Regional Laboratories at Peoria, Illinois. Norepol was the fruit of this work and represents the first successful attempt to derive relatively long-chain polymers from fatty oils. The origin of the name Norepol is NOrthern REgional POLymer.

The American Resinous Chemicals Corporation had been experimenting along similar approaches in its products Vulprene and Sulprene when the Regional Laboratory announced its discovery. The company offered its facilities for the commercial production of Norepol, which led in October 1942, to Vulprene 72-28AR (semi-compounded Norepol). Certain specific details concerning the preparation and structure of these materials are under government secrecy orders, but within these borders this article will attempt to indicate the chemistry of Norepol and its analogues, its compounding and uses, and its limitations.

The term "synthetic rubber," if one wishes to be meticulously accurate, has been erroneously applied to the well-known polymerization products such as Bunas, polychloroprenes, polyisobutylenes and the like because, to date, no substance has been prepared completely resembling rubber in all of its physical and chemical properties. In other words, any product which, among other properties, demonstrates an elastic memory and high tensile strength has been generally called a "synthetic rubber." It is within the spirit of this definition that the fatty oil derivatives Norepol, Vulprene and Sulprene find a relative position in the table of "Synthetic Rubbers." These fatty oil derivatives have at times been termed neo-synthetics and their relationships may be somewhat arbitrarily pictured by the following table:

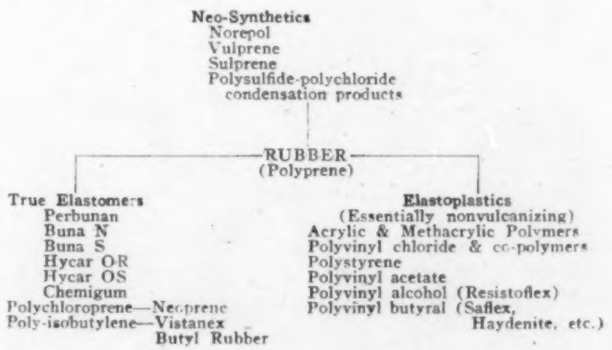


CHART OF AVAILABILITIES

Rubber	Natural product	Critical because source no longer available
True Elastomers	Critical raw materials	Critical new equipment required
Elastoplastics	Critical raw materials	Equipment complex and limited
Neo-synthetics	Relatively noncritical raw materials	Equipment standard and not too critical

Butadiene, styrene, isobutylene, acrylonitrile, vinyl butyral and the like are all at the present time relatively unavailable when one considers the huge tonnages required even by the reduced Baruch program. Large supplies of fatty oils are available but within the past month the need for edible fats has somewhat clouded the outlook for the neo-synthetics and their use will compete with oil requirements for the manufacture of synthetic resins and plasticizers. The level of their availability will be determined by the relative importance of the uses to which they will be put.

Synthesis

The primary effort thus far in the production of synthetic rubbers has been the search for molecular building blocks which will polymerize to produce long chain linear polymers which may or may not permit of further vulcanization. It is well known that dibasic acids may be esterified with dihydric alcohols to produce long chain molecules. If these molecules contain reactive unsaturated groupings, they may be further cross-linked to yield polymers which begin to exhibit rubbery characteristics. By special segregation methods, unsaturated fatty acid fractions may be obtained from oils such as soya, linseed, fish oils and the like, which under the action of heat and catalysts yield polymers having the action of dibasic acids. By esterification or condensation of these dibasic acids with dihydric alcohols, long chain molecules may be built up which have the property of being vulcanizable to produce rubbery materials.

Vulprene is the generic name for a series of polymers ranging from viscous, tacky, oil-like materials to sticky solids and finally to tough rubber-like vulcanizates. Structurally, the Vulprenes are similar to the Norepols and vary by the technique of manufacture, condensation reactions, and addition products. This article will concern itself primarily with ester derivatives because they are now available commercially in substantial tonnages and their characteristics have received much more investigation than have the other derivatives.

The first step in the production of Vulprene yields a viscous polymer termed "polyester." By controlling the degree of polymerization, it is possible to prepare fluid polyesters soluble in naphtha or aromatics. Further polymerization yields tougher gels which become progressively insoluble.

By carrying the reaction further in the presence of sulfur, accelerator, carbon black, zinc oxide, etc., Vulprene is obtained. This product, as it comes from the reactor, is a partially vulcanized granular or sheeted form. This Vulprene may then be further compounded and extended by the rubber manufacturer, milled, molded, and vulcanized in the conventional rubber equipment.

The use of a partially compounded base of necessity restricts its versatility since many manufacturers of rubber products prefer the specific accelerators, sulfur ratios, antioxidants and the other compounding ingredients as developed in their own laboratories. It was desirable, therefore, to prepare a "polyester" raw stock which would be directly millable or capable of being handled in a Banbury. Although the problem has finally been solved and a "millable polyester" (Vulprene C2-1) is available in commercial quantities, the tonnages are still low and the semi-compounded base remains more readily available in carload quantities.

By starting with purified fatty acid fractions, the Regional Laboratories have been able to obtain tensile strengths between 1,000 and 2,000 pounds and elongations up to 300%. At present, the procedures employed are scarcely practical but the results are an indication of what the future may develop.

The costs of commercial Vulprene are still high when compared with the performance of synthetics and the cheapness of reclaim. The price factor has been an obstacle in the wide exploitation of the Norepol process because there is little advantage to be gained on the part of a defense manufacturer who is permitted to use crude rubber, synthetics or reclaim. Use for civilian purposes has in some instances come against price ceilings of OPA.

Compounding

Vulprene or Norepol in distinction to Buna and some of the other synthetic rubbers can be milled without difficulty on a chilled rubber mill in order to form workable sheets. There is no danger of scorching but warm mills should be avoided as they will promote sticking and create undue milling difficulties.

Vulcanization of Vulprene is carried out according to standard procedures, preferably in a mold under forty pounds steam pressure for thirty to forty minutes. Vulprene tends to have a low tear strength when hot and care is required with intricate molds bearing marked undercuts. Tubing may be fabricated by extrusion with a cold barrel and hot die.

A good grade of Vulprene or Norepol possesses tensile strengths of 400-700 pounds per square inch, elongations of 125 to 250% and a Shore Durometer hardness of 50-70, although in present commercial practice the ranges more nearly approximate the lower figures. Vulprene remains flexible at—40° F. and possesses the unique property of improving on aging.

As would be expected, carbon blacks play a very important role in strengthening these neo-synthetics and imparting the desirable rubber-like qualities of elongation, abrasion resistance, tear strength, and improved tensiles.

A hard black, such as channel black, greatly improves the tensile strength of a vulcanized sample but reduces elongation and resiliency. P-33 or other soft blacks give good tensile strength and elongation. They can be added in substantial amounts above those of channel blacks or hard blacks which tend to increase tensile strength but reduce elongation and promote brittleness. Some typical data are presented in Table I.

The effects of other types of blacks may be judged from some runs based on millable polyester (Table II).

Sulfur has been generally employed as polymerizing agent or vulcanizer to promote cross linkage and per-

TABLE I

	I	II	III
Vulprene	100.	100.	100.
Channel Black	40.	40.	...
P-33 Black	...	40.	80.
Sulfur	6.0	6.0	6.0
Zinc Oxide	6.0	6.0	6.0
Accelerator	2.0	2.0	2.0
Neozone D	1.0	1.0	1.0
Tensile Strength	520	645	425
Elongation	100%	100%	260%

haps also to increase chain length. Interesting results have also been obtained with benzoyl peroxide.

The optimum sulfur range is believed to be between 3 and 4%, although under carefully controlled conditions, higher percentages upwards to 6% have yielded good tensile products with durometer readings in the 75's. The use of higher percentages of sulfur promotes blooming. The presence of ultra accelerators considerably decreased the effective amount of sulfur required. A good dispersion of the sulfur through the matrix is essential for accurate tensile results. This condition also holds for other compounding materials.

Zinc oxide is as important an adjunct to the vulcanization of the neo-synthetics as are the accelerators. A fair cure can be obtained by the addition of sulfur and zinc oxide alone. Ranges of 3 to 6% of zinc oxide have been found necessary. The higher percentages of zinc oxide are at present favored. The study to differentiate between the effect of various grades of zinc oxide is still in progress. Clays, calcium carbonate and iron oxides have been found useful as reinforcing agents. The use of stearic acid improves milling and vulcanization characteristics.

0.5 to 2.0% accelerator has been used depending upon other ingredients. The lower percentages of the accelerators are recommended at present due perhaps to the tendency of ultra accelerators to cause sulfurization rather than sulfur bridging between the ester molecules. Mercaptobenzothiazole has been used as a general accelerator for commercial work. Benzothiazol disulfide together with diphenyl guanidine are also being utilized to a considerable extent. Choice of accelerator appears to have somewhat less effect on the final product than do changes in percentages of the other compounding ingredients. Captax was widely used, at first rather arbitrarily; it is being supplanted by Altax and Tuads, the former particularly where jar rings for food packaging are desired.

Vulprene appears to have good resistance to aliphatic solvents, mineral and fatty oils, and to non-oxidizing inorganic acids. Its resistance to higher alcohols and aromatic solvents is poor. Results of specific tests are shown in Table III.

The application of the neo-synthetics is limited by their lower tensile strength, elongation, and abrasion resistance as compared with those possessed by the Buna and other synthetics or natural rubber. However, they are compatible with crude and reclaimed rubber and in view of the shortage of true extenders for these, some use is developing for direct extension.

At present, the larger uses center about simple moldings such as heel pads, bumpers, grommets, washers, sporting goods, tubing, hose, stone guards, stripping, floor treads, bases, insulation, and tires for baby carriages. Tests on tube use of Vulprene for tire recaps have been only fair approximating the performance of some Thiokols. At the latest report a recap had gone about 1,300 miles without signs of failure. This may be compared with reclaim performance of about 6,000 miles. Important interest is now being centered in the use of Vulprene for the production of jar rings for the canning industry.

Other uses now in the process of development include the coating of fabrics, soles and heels for shoes, printers' rolls, tank linings and sponge. The last may be produced directly by baking polyester containing sulfur and the other customary rubber compounding ingredients. The gases formed develop a spongy structure. The addition of a surface-active agent can be employed to modify and to create uniform pore size. However, the method is somewhat clumsy and better results may eventually be obtained by starting with the "millable polyester."

Solutions and Dispersions

Two interesting and very important ramifications of this work have led to Vulprene Solutions and Dispersions both of which, although already available commercially, are still in rapidly evolving state.

Vulprene solutions may be made in two ways, either by dissolving partially polymerized polyester, or by polymerizing a solution of polyester. Solutions of this type may be fortified by the addition of minor proportions of natural or synthetic rubbers and synthetic resins to yield bases for adhesive tapes and masking papers of a wide variety of utility. By incorporating vulcanization ingredients, it is possible to prepare films which will cure at about 130° C. for one-half hour to tough, water-resistant coatings. Such films may be laid down either from aliphatic or aromatic solvents. The cohesive strengths of unvulcanized, uncompounded Vulprene solutions are as yet fairly weak but become considerably improved upon vulcanization.

The urgent problem has been to produce a latex from Vulprene. At present, the properties of a film produced from Vulprene latex resembles that of a soft reclaim dispersion. Simple dispersions of uncompounded Vulprene are finding increasing use as rubber latex extenders in the field of shoe adhesives. Compounded, vulcanizable dispersions are meeting with success in the manufacture of adhesive and masking tapes, in the impregnation of paper, as can sealing compounds, in binders for leather finishes, and coatings for artificial leather. Much still remains to be

TABLE II

	I	II	III	IV	V	VI	VII	VIII	IX	X
Millable polyester.	100	100	100	100	100	100	100	100	100	100
Sulfur	4	4	4	4	4	4	4	4	4	4
Zinc Oxide	6	6	6	6	6	6	6	6	6	6
Captax	2	2	2	2	2	2	2	2	2	2
P-33	80	..	..	..	..	..	..	..	..	..
Cabot #6 Spheron.	..	40	..	..	..	..	..	..	..	..
Kosmobile 77	..	..	40	60	..	..	..	..	..	..
Kalvan	..	40	40	..	80	40	..	40	..	..
Cabot #6	..	..	..	..	..	..	40	60	..	..
Cabot #9	..	..	..	..	..	..	..	40	60	..
Atomite	..	..	..	..	..	..	..	..	..	80
Shore Hardness	47	64	65	48	55	70	65	55	70	40
Elongation *	100	60	50	80	90	60	75	100	40	125
Tensile Strength	516	510	466	459	495	687	587	456	391	391
Tensile Product	516	306	233	367	446	412	440	456	156	489

* Per cent.

learned concerning their compatibilities and compounding characteristics.

Sulprene

Both Norepol and Vulprene are based on the more expensive fatty oils and also contain minor amounts of sub-critical materials. At about the same time Norepol and Vulprene were announced, it was possible to offer a completely noncritical material, Sulprene, produced by the polymerization and condensation of resins and fatty oils. As a result of greater production and ease of manipulation, the cost per pound for the Sulprenes is substantially lower than that for Vulprene or Norepol.

As with Vulprene, the term Sulprene is also generic for a series of polymers ranging from soft sticky fluids to rubber-like polymers. Sulprene 56-36 is the first stage in the polymerization process, being a soft, sticky fluid used as a tackifier and impregnant for friction tapes. Sulprene 56-40 is a millable product with which fillers such as carbon black may be compounded to yield improved tensiles and elongations.

The Sulprenes are peculiar and differ from Norepol or the Vulprenes in that they need not be vulcanized in order to obtain a useful product, but can be molded and extruded as desired with adjustments of temperature and pressure. The Sulprenes are slightly thermoplastic in nature.

Although vulcanization results in no noticeable increase in tensile or elongation, it has been found that the surface characteristics improve upon curing. A typical formulation is:

	Dry Parts
Sulprene 56-40	100
Zinc Oxide	5
Stearic Acid	0.5
Sulfur	2-3
Captax	1.0-2.0
Antioxidant H	.5-1.0

Cure: 15-20 minutes @ 30 pounds steam

Sulprene will burn but will not support combustion. However, its low tensile of 200 to 300 pounds and low elongation up to 100% render it unsuited for many purposes. The properties are being gradually improved.

TABLE III—CHEMICAL RESISTANCE OF VULPRENE

(1-Inch Squares Immersed for 72 Hours in 100 c.c.)

1. Benzol	Swollen—very weak
2. Toluol	Swollen—weak
3. 65 Octane Gas	Sl. Swell
4. Skelly Solve C	No effect
5. Skelly Solve F	No effect
6. Motor Oil	No effect
7. Ethylene Dichloride	Swollen
8. Chloroform	Disintegrates
9. Acetone	Sl. Soft
10. Ethyl Alcohol	Sl. Soft
11. Ethyl Acetate	Sl. Swell
12. Cottonseed Oil	No change
13. Butanol	Sl. Soft—weak
14. Conc. HNO_3	Disintegrates
15. Conc. HCl	Softened
16. Dil. HCl	No change
17. 10% NaOH	Sl. Soft
18. 10% NaCl	No change
19. Cold water	No change
20. Boiling water	No change
21. Superheated steam	Softens
22. Ozone	No effect noticeable after one hour's exposure
23. Oxygen	Improves after 48 hrs. in bomb @ 80° C.

In conclusion, we may summarize as follows:

1. Rubber-like products are available from relatively noncritical materials based on the Norepol process.
2. Vulprene and Sulprene may be handled on the conventional rubber equipment with the standard procedures.
3. The usual compounding technique familiar to the rubber industry may be utilized.
4. Vulprene and Sulprene have been used to prepare solutions resembling rubber cements and dispersions resembling latex.

ACKNOWLEDGMENT

The authors wish to acknowledge the assistance of Mr. S. Castleman in the experimental work discussed in this article.

PHYSICAL PROPERTIES OF SYNTHETICS AND NATURAL RUBBER

	Tensile Strength Lbs./sq./in.	Shore Durometer Hardness	Effect of Heat	Abrasion Resistance	Effect of Aging
1. Buna S	500-3100	15-90	Stiffens	Equal Rubber	Resistant
2. Butyl Rubber	500-3000	15-90	Softens	Good	Resistant
3. Chemigum (oil resistant)	800-3500	30-90	Stiffens	Excellent	Stiffens
4. Hycar OR (soft)	800-3500	15-90	Stiffens	Excellent	Highly Resistant
5. Koroseal (hard)	2000-9000	80-100	Softens	Good	Resistant
6. Koroseal (soft)	500-2500	30-80	Softens	Good	Resistant
7. Neoprene	1000-4000	15-90	Stiffens	Excellent	Highly Resistant
8. Norepol	450-1100	30-75	Softens	Fair to Poor	Improves—Resistant
9. Perbunan	500-3500	15-90	Stiffens	Excellent	Highly Resistant
10. Resistoflex	1500-5000	80	Softens	Good	.....
11. Sulprene	250-600	35-65	Softens	Poor	Better than Rubber
12. Thiokol FA	1400-2000	25-90	Hardens	Fairly good	.....
13. Tygon T	9000	100	Softens	Good	.....
14. Vistanex (medium)	250	20	Softens	.....	Better than Rubber
15. Vistanex (high)	500	..	Softens	.....	Better than Rubber
16. Vulprene	425-800	45-75	Softens	Fair to Poor	Improves—Resistant
17. Natural Rubber	1000-11,000	30-100	Softens	Excellent	Good Resistance

Progress Report No. 2 of the Office of the Rubber Director

IN presenting the second progress report of the Office of the Rubber Director, I again should like to quote from the Report of the Rubber Survey Committee of September 10, 1942, and from the President's letter of one week later. The Report said:

"Of all critical and strategic materials, rubber is the one which presents the greatest threat to the safety of our nation and the success of the Allied cause. Production of steel, copper, aluminum, alloys or aviation gasoline may be inadequate to prosecute the war as rapidly and effectively as we could wish, but at the worst we are still assured of sufficient supplies of these items to operate our armed forces on a very powerful scale. But if we fail to secure quickly a large new rubber supply, our war effort and our domestic economy both will collapse. Thus the rubber situation gives rise to our most critical problem." (Report of the Rubber Survey Committee, September 10, 1942).

This statement of the problem, together with the following sentence from the President's letter of September 17, which stated in part: "I want to carry out the recommendations in the Baruch Report as fully as possible ....," have been the basis upon which my organization has operated since my appointment as Rubber Director.

My first progress report emphasized the necessity of avoiding further delay in building the rubber program. Since then it has become more and more evident that the timing of this program is critical and will determine its success or failure. Consequently, this report deals in some little detail with the present status of the building program.

The Plant Construction Program

Upon convening in the fall of 1942, the Rubber Survey Committee found a program under way which then contemplated the production in the United States of 877,000 tons of synthetics a year. In its report it recommended the following plan for increasing that program:

(1) Carrying through the plants then planned for producing butadiene for Buna S.

(2) Providing an additional 100,000 short tons a year of "quick" butadiene from refinery conversions.

(3) Providing 30,000 tons a year of Buna S from grain by processes to be selected in the spring of 1943.

(4) Erecting sufficient additional copolymerizing and styrene capacity to balance the resultant total.

(5) Erecting plants to produce an additional 20,000 tons of Neoprene.

In the fall of 1942, contracts were let for the additional Neoprene and the refinery conversions recommended by the Baruch Committee.

Note: Progress Report No. 1 was published in full in the December, 1942, issue of RUBBER AGE.

TABLE I—THE BARUCH COMMITTEE PROGRAM
(UNITED STATES ONLY)
[Long tons per year]

	August 1942 program	Additional recommended capacity	Total
Buna S	705,000	140,000	845,000
Neoprene	40,000	20,000	60,000
Butyl	132,000	.....	132,000
Total	877,000	160,000	1,037,000

For the latter, the "Houdry Process," which by then had been sufficiently piloted, appeared to be a most promising method. Consequently, 60,000 tons of annual capacity were allocated to it in addition to the 15,000 ton Houdry plant in the initial program and another 15,000 ton plant under consideration for the Pacific Coast. The latter is needed to protect the feed stock situation on the West Coast where the demands of other programs, according to the Petroleum Administration for War, may force a change early next year from the cracking of naphtha to the synthesizing of butadiene from butane.

This was the situation on November 30, 1942, when Progress Report No. 1 was issued. Since that time, there have been the following new developments:

(1) The shortage of critical components (such as valves, heat exchangers, turbines, blowers, pumps, motors, etc.) is so great that the refinery conversions for "quick" butadiene production cannot be finished in anything like the time originally envisioned by the Baruch Committee.

(2) It has been decided that other programs are of equal urgency with the rubber program, so that further delays must be expected in completing the last part of the rubber program.

(3) The expansion of the high-octane gasoline program makes it essential that everything possible be done to avoid unnecessary drains upon components, facilities, feed stocks, and labor usable by both programs.

(4) It has become evident that some of the large butadiene manufacturing units may ultimately run at more than their originally rated capacity. It is possible that by the end of 1943 the alcohol butadiene plants may produce 55,000 to 110,000 tons more butadiene a year than their rated capacity.

Consequently, it has seemed advisable to cancel some of the more recently approved conversions which could not be expected to contribute much, if any, "quick" butadiene needed during the summer and early fall of 1943.

Though no doubts now exist as to the workability of

TABLE II—PRESENT BUTADIENE PROGRAM
[United States only]

Basic process	Rated capacities in terms of Butadiene, short tons
From—	
Alcohol	220,000
Butane	75,000
Butene by dehydrogenation	265,100
Naphtha cracking (refinery conversion)	96,760
Total	656,860

TABLE III.—PRESENT SYNTHETIC PROGRAM NOW BUILDING, UNITED STATES ONLY
[Long tons per year capacity]

	Baruch Committee recommendations	Now building (rated capacity)	% of committee recommendations now building
Buna S	845,000	705,000	83
Neoprene	60,000	40,000	67
Butyl	132,000	68,000	52
Total	1,037,000	813,000	78

the Houdry Process, transportation difficulties incident to the location of certain partly built plants and the difficulty of procuring certain units made it necessary to cancel the contemplated conversions at Wood River, Illinois; Beaumont, Texas; and some others.

Even though experience should prove the canceling of these conversions to have been an unwise move, the demand for component parts should be so much less by early fall that other steps could then be taken which would not delay their share of the program for more than a month or two, and would still provide the butadiene needed in 1944.

The accompanying Table II shows the effect of these developments on the butadiene part of the program.

The rated capacity of the plants now contemplated will produce enough butadiene to make 761,900 long tons of Buna S. Though the Baruch Committee recommended providing enough butadiene for 845,000 tons of Buna S a year, it is not now planned to authorize any further plants except those to produce the recommended 30,000 tons a year from grain. In view of the present shortage of critical components, the possibility that many of the plants will run at better than rated capacity makes it unwise to start new plants until some experience has been gained from those nearing completion.

Reductions have also been made in the Neoprene and Butyl programs. Neoprene has been reduced from the recommended 60,000 long tons to 40,000 and Butyl from 132,000 long tons to 68,000. The reasons for these reductions are:

(1) There may be a sufficient excess of butadiene by the winter of 1944 to permit a replacement of these tonnages with Buna S.

(2) Further testing and experience have indicated to the military authorities that, except as a last recourse, Neoprene and Butyl will not be used for military tires.

(3) The need for isobutylene in the high-octane program is more urgent than its use in Butyl rubber.

The Baruch Committee also recommended additional plants for styrene and copolymerization. None has been started. It is believed that there may be enough overcapacity in the present plants to balance the existing program without further complicating the parts situation. Because of the scarcity of components, new plants, in any case, could not be completed before the fall of 1943. Here again it seems best to use the experience to be gained from plants now nearing completion before starting new plants.

Therefore, the present rubber program in terms of rated capacities is as shown in Table III.

Plants are now being built to make enough butadiene to produce 761,900 tons of Buna S, and enough styrene to produce 798,600 tons of Buna S.

The accompanying map shows the approximate location of these plants. This map and Exhibit B further emphasize the necessity of determining the rate at which the various plants will produce or consume butadiene and styrene, and the transportation problems involved, before new plants are built fully to balance the program.

Plant Construction

In Progress Report No. 1 (Page 5, column 1) I said, "Present indications are that the impact of competitive programs will cause a delay. It is too early to say how much of a delay. A scheduling mechanism, now being put into effect, may solve part of the problem. . . ."

This scheduling mechanism is the "directive." This is not a super priority. It is designed to fulfill several essentials: it requires suppliers to furnish materials *only* at the latest date on which it is possible to install them in an orderly fashion, it prevents the misuse of high priorities *to accumulate* critical materials in advance of needs at the expense of other programs, and it

TABLE IV—PLANTS UNDER DIRECTIVES I & II, UNITED STATES ONLY[1]
[Long tons rated annual capacities]

	Baruch Report recommendation	Now under directive[1]	% of capacity recommended by Baruch Committee, now under directive	% of total committee program
Buna S	845,000	435,000	51.5	41.9
Butyl	132,000	7,000	5.3	.7
Neoprene	60,000	10,000	16.6	1.0
	1,037,000	452,000	[2]43.6	43.6
In Terms of Buna S (82% of Synthetic Program)				
Butadiene	845,000	470,000	55.6%×82%=45.6%	
Styrene	845,000	538,000	63.5%×82%=52.1%	

[1] These include plants now built or presently finishing without directives.
[2] Weighted average.

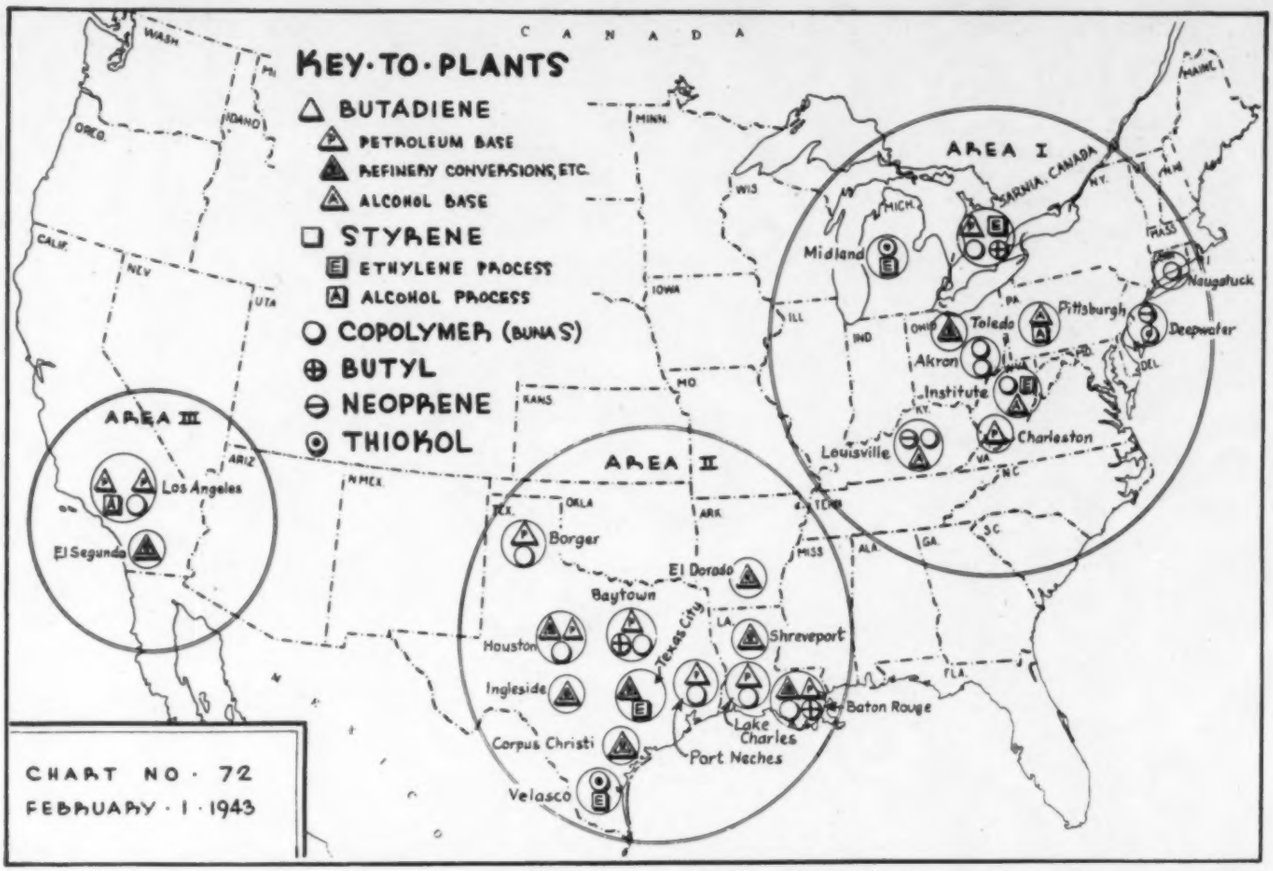


EXHIBIT A—Map of the United States Showing the Locations of Synthetic Rubber Plants (as of February 1, 1943).

permits the proper authorities to balance the various essential programs that compete for the same components or facilities. It has proven to be an effective "bottle-neck-buster."

On December 4, 1942, part of the program was given urgency numbers and directives, with an understanding that, in order to complete the necessary plants, a further increment would be given the same treatment one month later.

On January 29, 1943, a further determination was made of this matter.

As of today, plants now sequenced and under directive, together with those finished or expected to be finished during the next few months, have total rated capacities of 452,000 tons of synthetic rubbers a year, or 43.6% of the 1,037,000 tons recommended by the Baruch Committee. (See Table IV and Exhibit C.)

It should be noted that Table IV shows only that portion of the program under Directives and the plants which have been built or are about to be finished without such directives (43.6%); whereas Table III shows the entire building program, including plants being erected with lower priority ratings.

Because the manufacture of butadiene and styrene involves at least a dozen processes, many of which are unproved, it has seemed wise to provide greater raw material capacity than for copolymerization. Also, because of the size of units and geographical location, slightly more styrene capacity is available than its counterpart, butadiene.

Expected 1943 Production

As a result of the many delays which have beset the program, we now estimate that the expected capacity that will come into production during the various months of 1943 will produce only a total of 241,000 long tons (equivalent crude value) of synthetic rubber, instead of the 354,000 tons envisioned in Progress Report No. 1. This includes 3,000 tons from a Canadian plant.

This estimate is based on a consideration and weighing of both conservative and optimistic production rates. However, it must be remembered that it is an estimate which will eventually be proven wrong one way or another.

In addition to small amounts of butadiene being made in small private plants, the first of eleven Government financed units for making butadiene from alcohol and a unit for making butadiene from petroleum have started production. It is contemplated that the first Government-financed plant for the production of styrene will soon start operations.

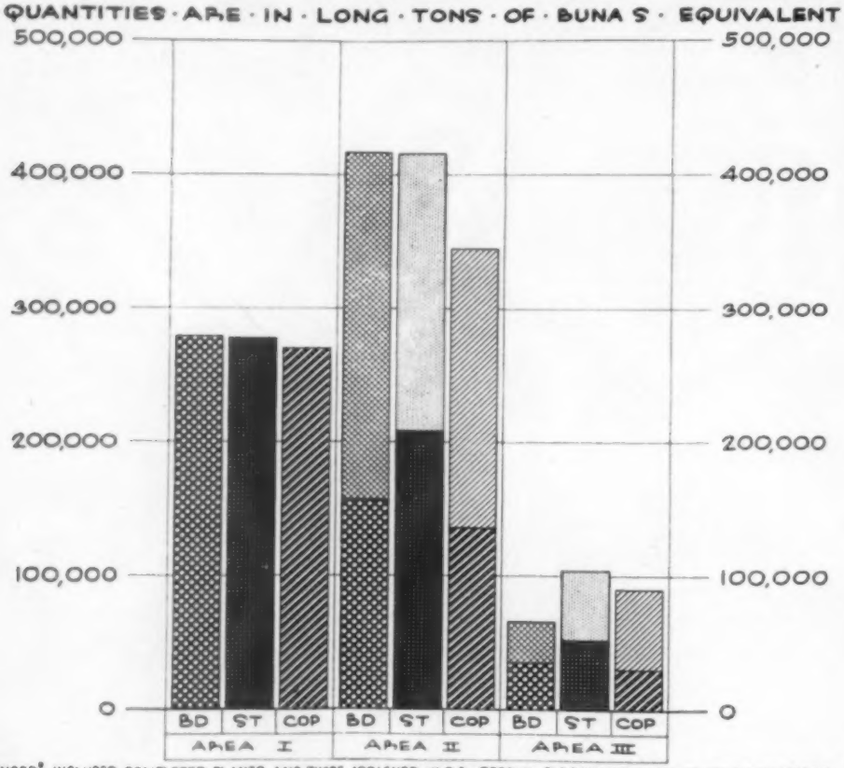
Exhibit D accompanying this report shows the quarterly production estimates for each type of rubber which goes to make up the total of 241,000 tons for the whole year.

Program Summary

The Rubber Program involves three major problems: (1) To bring into production, as rapidly as possible,

KEY	AREA I	AREA II	AREA III	TOTAL
BUTADIENE	278,800	417,100	66,000	761,900
NON-SEQUENCED*	—	260,800	31,100	291,900
SEQUENCED†	278,800	156,300	34,900	470,000
STYRENE	277,900	416,500	104,200	798,600
NON-SEQUENCED*	—	208,500	52,100	260,600
SEQUENCED†	277,900	208,000	52,100	538,000
COPOLYMER	270,000	345,000	90,000	705,000
NON-SEQUENCED*	—	210,000	60,000	270,000
SEQUENCED†	270,000	135,000	30,000	435,000

ALL QUANTITIES ARE IN LONG TONS OF BUNA S EQUIVALENT



† "SEQUENCED" INCLUDES COMPLETED PLANTS AND THOSE ASSIGNED W.P.B. SPECIAL DIRECTIONS WITH [illegible] NUMBERS
* "NON-SEQUENCED" INCLUDES ALL OTHER PLANTS IN PRESENT PROGRAM NOW BUILDING

EXHIBIT B—Rated Annual Capacities by Areas (excluding Sarnia, Canada) of Butadiene, Styrene and Copolymer Facilities.

enough synthetic rubber capacity to balance supply and demand before ever-dwindling stocks have declined to a critical minimum.

(2) To maintain enough of the natural crude stockpile to make heavy duty military tires, self-sealing tanks, and other military items for which synthetic rubber is not yet adequate.

(3) Further to increase the capacity of the synthetic rubber industry and to develop all possible quick sources of natural rubber to take care of the additional needs in 1944. These 1944 needs include:

(a) Added requirements of our Allies as their inventories disappear.

(b) Replacement of depleted inventories of necessary industrial equipment, most of which is used in the manufacture of military supplies.

(c) Replacement, during 1944, of essential civilian tires which, after recapping with presently available reclaimed rubber, will have worn out their carcasses by mid-summer of 1944. These are tires upon which the basic economy of the nation depends—the growing, distribution, and marketing of foodstuffs and other essential products, plus the transportation of essential workers to their jobs.

(d) Use of rubber by the military authorities in many essential categories which have been restricted temporarily due to the present stringency.

The above three major problems, while closely intertwined, in a sense are independent of one another. It is the first which has given rise to the demand that highest priorities be given to rush the plants necessary to balance the absolute minimum of immediate consumption with new supply.

Other Sources of Supply

Approximately 440,000 tons of crude rubber were on hand in the United States and Canada on January 1, 1943. Many uncertainties affect estimates of possible imports of crude rubber from various producing areas still in Allied hands, such as ocean transportation hazards, quality of rubbers produced, and amounts actually to be harvested from the many programs now under way in various tropical nations. After estimating the quantities to be shipped to our Allies, and taking all of the other factors mentioned into consideration, it is expected that we can count on receiving, in terms of plantation crude, a new supply of 35,000 tons during 1943.

Requirements

Present estimates of essential 1943 requirements to be filled by rubber from the United States and Canada are:

	Tons
U. S. Military	312,500
Commercial Vehicles	65,000
Sundry Industrial, Indirect Military, and Civilian	41,000
Canadian	47,500
Export (as finished goods)	105,000
British Deficiency (Buna S)	41,290
	612,290

Several explanations of this tabulation are desirable:

(a) Every request for rubber is given a most searching analysis, and reductions are made whenever it is possible without seriously interfering with the war effort. Until the synthetic production is a reality, present inventories of finished rubber goods will continue to be used wherever possible to meet requirements and so to conserve the crude rubber stock pile. To the extent that this procedure runs down still further those inventories which are already depleted, synthetic rubber will have to be used later in the year to replace these exhaustions and return inventories to at least working levels.

(b) The military forces (Army, Navy, Air Corps, Maritime Commission) have cooperated in reducing their use of rubber, and it is hoped that rubber production can be stepped up enough, at an early date, to make available enough rubber so as to fill their needs for many essentials, such as tank treads, shoe soles, rubber soles, etc., that have been given up during the period of extreme stringency.

(c) The heavy load being placed on bus and truck tires requires the use of new rubber for such equipment. The war effort requires an efficient internal transportation system, of which passenger busses and trucks are an integral part. No further loads can be placed on other methods of transportation without serious economic results. A wartime trend toward maximum loading has increased wear of tires per mile.

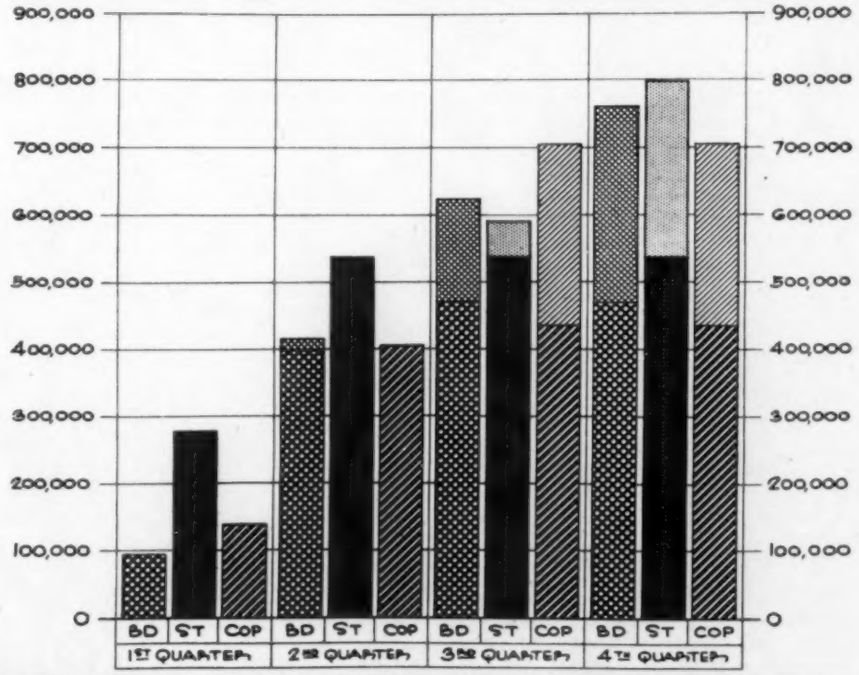
(d) Forty-one thousand tons have been allocated to industrial and civilian uses. Of this total, 3,000 tons, or less than one-half of one per cent of the year's estimated consumption, will be used for bonding reclaimed tires for recapping. Some quantities are provided for items essential to the public health such as drug sundries and footwear, with most of the balance going to indirect military uses such as mechanical goods, cable and wire, hose and beltings.

(e) Canada's total requirements are divided much in

	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
BUTADIENE	94,600	415,600	622,800	761,900
NON-SEQUENCED●	—	17,100	152,800	291,900
SEQUENCED▼	94,600	398,500	470,000	470,000
STYRENE	278,100	538,000	590,900	798,600
NON-SEQUENCED●	—	—	52,900	260,600
SEQUENCED▼	278,100	538,000	538,000	538,000
COPOLYMER	137,500	405,000	705,000	705,000
NON-SEQUENCED●	—	—	270,000	270,000
SEQUENCED▼	137,500	405,000	435,000	435,000

KEY: BD (NON, SEQ) ST (NON, SEQ) COP (NON, SEQ)

ALL · QUANTITIES · ARE · IN · LONG · TONS · OF · BUNA S · EQUIVALENT



▼ 'SEQUENCED' INCLUDES COMPLETED PLANTS AND THOSE ASSIGNED W.P.B. SPECIAL DIRECTIONS WITH URGENCY NUMBERS

● 'NON-SEQUENCED' INCLUDES ALL OTHER PLANTS IN PRESENT PROGRAM NOW BUILDING

EXHIBIT C—Accumulated Rated Annual Capacities of Butadiene, Styrene and Copolymer Facilities (excluding Sarnia, Canada) by Quarters for Year of 1943.

the same way as are those of the United States, with the military program taking the bulk of the available supplies.

(f) Export requirements are for Lend-Lease orders manufactured in the United States and for items to be exported by the Board of Economic Warfare. All are part of the war effort.

(g) The British deficiency is the total amount of rubber which we must ship to the British Empire to maintain a safe supply on hand in its manufacturing plants, over and above its present inventory and expected crude imports. This safe working inventory in Great Britain is now considered 50,000 tons instead of 66,000 tons originally recommended by the Baruch Committee.

(h) Progress Report No. 1 considered only the Canadian deficiency rather than Canada's full needs. It also did not include the requirements for Buna N.

Balance

The estimated resultant stocks are shown graphically in Exhibit E. With supplies of 716,000 tons and requirements of 612,000 tons, it is estimated that we shall be left 104,000 tons on January 1, 1944. This is too low for comfort.

It is essential that the rubber manufacturing plants maintain an inventory of at least 100,000 tons or face closing down, with resultant dispersal of highly trained manpower.

It is also important that substantial quantities of natural crudes be kept for use with synthetics.

Therefore, this 100,000 ton working inventory is the irreducible minimum below which stocks cannot fall without a critical dislocation of the entire military, industrial, and civilian economies.

The presently expected most critical period is from October 1943 to March 1944, with December the low point; thereafter supplies should exceed consumption.

This forecast, of course, is subject to change during the next six months. If all synthetic plants come into production without undue difficulties, and if their output should exceed their rated capacities, we may be in a better position. The reverse could happen.

Every effort is being made to develop all possible sources of natural rubber which give promise of producing supplies in 1943 and early 1944. Certain developments have been fostered for harvesting after 1944, but only as insurance for the future. Some of the more important of these activities can be mentioned:

(1) The Rubber Reserve Company, in agreement with the Governments of Brazil, Peru, Bolivia, and Colombia, is pursuing a broad development in the Amazon Basin. While substantial quantities of crude rubbers once came from the Amazon, competition from the Far East has resulted in a decline of rubber procurement in this area. The present program calls for the movement of large numbers of workers, with attendant facilities, into the Amazon and it is hoped that substantially larger quantities of rubber will be produced than heretofore.

(2) The Board of Economic Warfare and the Rubber Reserve Company have combed the rest of Latin America for wild rubbers, and some importations are expected in the 1943 year.

(3) The cryptostegia development in Haiti originally proposed by the Board of Economic Warfare in conjunction with the Government of Haiti, is showing progress. Preliminary indications are that this plant provides a very good grade of rubber, but that small tonnage can be expected until well after midsummer 1944.

(4) The Guayule program, operated by the Department of Agriculture, is expected to produce less than 1,000 tons of rubber in 1943, but should produce substantially more in 1944.

(5) The Department of Agriculture is continuing its experiments with kok-saghyz (Russian dandelion) and goldenrod. It appears doubtful that either program will be extended in the immediate future because either would create substantial displacement of food crops, use of critical materials, and use of large manpower.

The efforts of Government agencies are being directed primarily toward increasing rubber production from all sources now available throughout the world. The estimate of imports of 35,000 tons is on the basis of "equivalent plantation crudes" and the efforts referred to may well produce quantities in excess of present estimates.

Despite all of these projects, however, this country cannot hope to get as much rubber from these sources in 1943 as it could from the early completion of one or two of the principal synthetic plants.

Authority and responsibility for acquiring natural crude rubber from Latin America has been delegated to the Rubber Reserve Company, and the responsibilities of both that company and the Board of Economic Warfare in the Rubber Program have been delineated.

1943	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER	YEAR TOTAL
BUNA S	3,800	13,900	59,500	118,000	195,200
BUTYL	100	1,500	3,300	13,500	18,400
NEOPRENE	4,400	4,900	9,100	12,000	30,400
BUNA N	2,900	3,900	4,800	4,800	16,400
TOTAL SYNTHETIC	11,200	24,200	76,700	148,300	260,400
CRUDE EQUIVALENT	10,800	22,900	70,700	136,600	241,000

ALL · QUANTITIES · ARE · ESTIMATED · IN · LONG · TONS

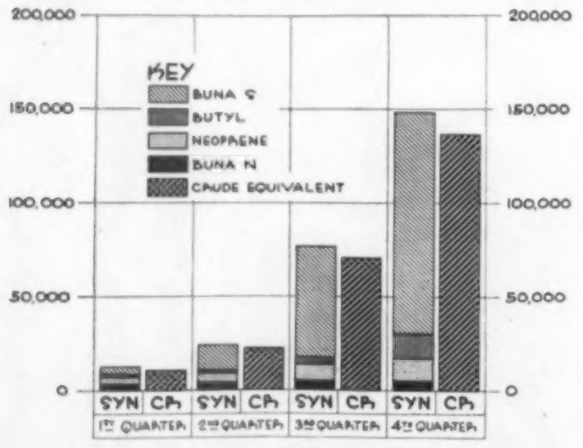


EXHIBIT D—1943 Estimated Quarterly Production of Synthetic Rubber Showing Crude Equivalent for Buna S, Butyl, Neoprene and Buna N. (Neoprene and Buna N capacities of private plants are included in these estimates).

Operations

Among the activities of this branch during the past two months have been studies of rubber requirements

of all claimant agencies and of processing machinery within industry; and bringing up to date statistical information on all matters pertaining to the production and use of rubber and rubber products. Steps have been taken to relieve some of the burden upon industry by eliminating reports not essential to the work of this office. Priority problems of maintenance and repair materials for plants have been followed and expedited.

The essential functions formerly handled by the Rubber Division of the Office of Civilian Supply, W. P. B., have been carried out and there have been organized eight product groups to supervise consumers' rubber requirements.

The use of recaps and recapping equipment have been supervised in order to assure the public the best possible results from the rubber allocated for its use.

The production of reclaimed rubber has been increased in order more nearly to meet military and civilian requirements.

Problems incident to the effect of the higher cost of synthetics upon the cost of rubber goods are being studied and worked out with the Office of Price Administration and the Rubber Reserve Company. It is hoped that decisions may be reached in the very near future.

Progress has been made in simplifying rationing regulations further to conserve rubber and to facilitate the securing of available rubber by those eligible, and in improving interpretations of gasoline rationing procedures, etc.

Russian Mission

As recommended by the Baruch Committee, a mission of technical experts left for Russia in early December. Cabled reports indicate that this mission is gathering valuable information and will return with a full report sometime in March.

Pilot Plants

Several pilot plants intended to produce butadiene from agricultural products and petroleum are in various stages of technical development. While some have been delayed because of the shortage of component parts and fabricating facilities, it has been possible to rearrange schedules and to move parts to other fabricators, so that an early completion of the principal pilot plants is now fairly well assured. The translation of certain promising processes into actual plant construction depends, of course, upon results of these piloting operations.

Technical Developments

Our technical staffs have been active on two broad fronts:

(1) The solution of problems in the production of synthetic rubbers and the improvement of their quality, and investigation of the many processes involved.

(2) The conversion of the rubber manufacturing industry to the use of synthetics as rapidly as these become available.

The industry has cooperated closely with our staff in every way and, particularly, by the generous support of its leading technologists in technical meetings on alcohol, petroleum and rubber, thus functioning in a most heartening manner on every possible problem connected with synthetic rubber production.

With the aid of the most recent and best informed

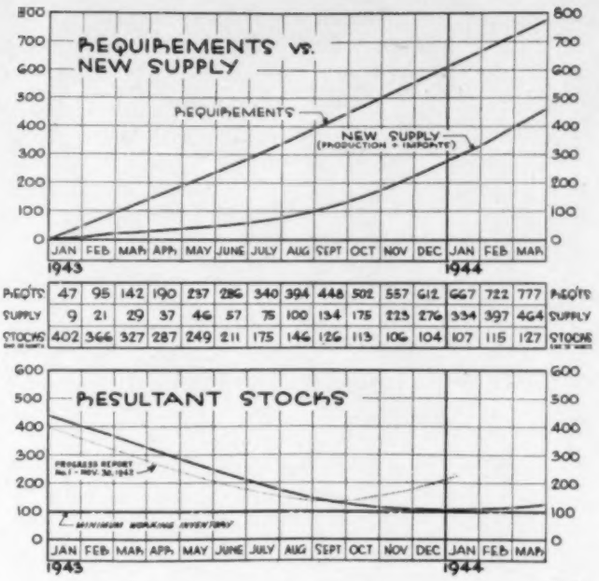

REQUIREMENTS VS. NEW SUPPLY
REQUIREMENTS
NEW SUPPLY (PRODUCTION + IMPORTS)
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC JAN FEB MAR
1943
1944
REQ'TS 47 95 142 190 237 286 340 394 448 502 557 612 667 722 777 REQ'TS
SUPPLY 9 21 29 37 46 57 75 100 134 175 225 276 334 397 464 SUPPLY
STOCKS 402 366 327 287 249 211 175 146 126 113 106 104 107 115 127 STOCKS
RESULTANT STOCKS
PROGRESS REPORT No. 1 - NOV. 30, 1942
MINIMUM WORKING INVENTORY

EXHIBIT E—Supply of Rubber vs. Essential Requirements of the United States and Canada from January, 1943 to March, 1944 (in thousands of long tons of crude and/or synthetic in terms of crude equivalent).

Notes: (1) Includes crude, Bunas, Butyl, Neoprene and Buna N. (2) Reclaim and Thiokol excluded. (3) All data are on a cumulative basis. (4) Resultant stocks obtained by subtracting difference between requirements and supply from initial stocks of 440,000 tons.

advice, it has been possible to re-appraise the merits of the various synthetics. Buna S still appears to be the best all-purpose rubber and its processing is much improved. On the other hand, some special synthetics, such as "Norepol" and "Arapol" may be set aside due to shortages in the specific food products used by them. "Thiokol" will probably be used primarily in recapping civilian tires and for a few specialty uses not filled in the past by rubber. For this reason, neither production nor consumption of this product is included in the over-all figures of the program.

The needs for rubber are being relieved by the use of certain synthetic resins now becoming available and by the substitution of reclaim rubber and rubber-extenders in many products.

Close cooperation has existed with the various divisions of the Army and Navy on specifications and conversions with valuable results. With their aid and with the help of industry, tire tests of all descriptions are being continuously conducted, to determine the best use of synthetics when they become plentiful.

Meanwhile, extensive research programs in many of the technical fields are under way in a number of universities and colleges throughout the country and a broad basis for exchange of research information is being developed, which should be of great benefit to the rubber program.

With continued cooperation of all concerned I hope within the next few months to be able to make a more encouraging report.

W. M. JEFFERS,
Rubber Director.

February 18, 1943.

Densities of Synthetic Rubbers

SYNTHETIC rubber can be produced under conditions which are much better known and more subject to control than those involved in the production of natural rubber. It is logical, then, to measure its density with greater precision, in the hope of being able to ascribe significance to the variations found when one sample is compared with another. The densities of different samples of natural rubber show variations as great as 1 or 2 per cent, and have never been correlated with the origin or subsequent treatment of the rubber.

The precise measurement of densities of synthetic rubbers is the subject of a paper by Lawrence A. Wood, Norman Bekkedahl, and Frank L. Roth, of the National Bureau of Standards, which appeared in the November, 1942, issue of *Industrial & Engineering Chemistry* and the December, 1942, issue of the *Journal of Research*, the latter the official organ of the Bureau. The paper gives the method of preparing specimens in suitable form, the details of the actual measurements by the method of hydrostatic weighings, and the results obtained for 18 varieties of synthetic rubber, including almost all of those now manufactured in the United States.

Samples of synthetic rubbers as received from the manufacturer were never found to be in a form suitable for precise measurements of the density. Even where there appeared to be no entrapped air and the surface seemed to be relatively smooth, molding produced specimens yielding higher and much more consistent values. A vacuum chamber was designed so that the specimen could be heated and molded under vacuum into a sheet about 1/16 inch thick. The density of specimens weighing about 1 gram each, which had been cut from this sheet, was determined. The values obtained with different specimens from the same sample rarely differed from each other by more than 0.05 per cent. The measurements were made soon after molding, because some rubbers recover and develop roughened surfaces and vacuoles which bring about a decrease in the apparent density.

Unvulcanized Buna S, prepared in a laboratory polymerization with a minimum quantity of materials other than butadiene and styrene, was found to have a density at 25° C of 0.9291 g/cm³. Corresponding values for butadiene-styrene copolymers produced on a commercial scale were as follows: Firestone Buna S, 0.9358; U. S. Rubber Co. Buna S, 0.9369; Standard Oil (N. J.) Buna S, 0.9390; Chemigum IV, 0.9391; Hycar O. S.-20, 0.9385; and Hycar O. S.-30, 0.9303 g/cm³. The densities of other common varieties of synthetic rubber were found to be as follows: Neoprene CG, 1.2307; Neoprene E, 1.2384; Neoprene FR, 1.1406; Neoprene GN, 1.2290; Chemigum I, 1.0135; Hycar O. R., 0.9992; Perbunan, 0.9684; Thiokol RD, 1.0564; Thiokol A, 1.5983; Thiokol FA, 1.3298; and Butyl B-1.45, 0.9175 g/cm³.

A new **Universal Angle Drive,** developed for the operation of valves, skylights, ventilators, etc., has been marketed by Payne Dean & Co., Laconia, N. H. The unique feature of the drive is, that while one shaft remains fixed in either a horizontal or vertical position, the other may be rotated around the axis of the fixed shaft through an angle of 180 degrees and locked in any position within this range.

Influence of Tension on Belting

CONCLUSIVE evidence that the life of transmission belting and V-belts is greatly influenced by the tension factor, and that an increase in the tension over that recommended for the belt operation will result in failure of the belt long before it should break down, is reported to be furnished by data from a series of recent tests conducted under the supervision of George H. Stewart, belting engineer of the B. F. Goodrich Co., Akron, Ohio.

Three grades of the present wartime construction of transmission belting were used in the series of tests, which were run at 15 pounds per inch per ply, a 720 pound total for the tension, the recommended figure, and at 18 pounds per inch per ply, a total of 864 pounds tension, on 4-inch pulleys. Belts were all 6 inches wide, 30 feet in length, spliced in 10-foot endless lengths. Tests were all highly accelerated.

Belt No. 1 ran for 95 hours before breakdown while under the 18 pound tension, and increased its life to 230 hours before failure when the 15 pound tension was used. Belt No. 2 ran for 88 hours at the 18 pound tension, and for 263 hours before failure at 15 pounds. Belt No. 3 ran for 15 hours under 18 pound tension, and the service life before failure jumped to 48 hours under the 15 pound tension.

Conclusions reached, Engineer Stewart's report says, are that an increase of three pounds per inch per ply over the recommended tension results in the belt giving only approximately one-third of its useful service life.

Kaumagraph Dry Transfers

RUBBERIZED fabrics and slick-surfaced rubber and synthetic rubber products of various kinds can be succesfully marked with Kaumagraph Dry Transfers in any one or two colors, according to the Kaumagraph Co., Wilmington, Delaware. Product name, trade mark or decription, or any design which may be drawn, is transferred from a roll or slip of tissue paper to the article by a momentary touch of a hot iron. The area of the marking may be practically any size—from the size of a dime up to a foot square if need be.

For over 40 years this marking method has been in use for textile products, rubberized fabrics, leather and a host of other articles. Research has developed new compositions of transfer materials which are perfectly adapted for all sorts of rubber products. Economy in application to plane or curved surfaces, attractiveness, fidelity of design reproduction, and the fact that the marking cannot be detached as can be labels and tags, are features which appeal to rubber manufacturers.

The manufacturers of Kaumagraph Dry Transfers are also often able to develop machinery which can be used for automatic application of the marking to almost any article.

A recent development of the American Foundry Equipment Co., Mishawaka, Indiana, is a new small parts **metal washing machine,** designed around a special patented endless tumbling belt. In its action it is said to be similar to the rotary drum type cleaning machine in that the work is tumbled to expose all surfaces to the cleaning action of the sprays, but its mechanical features are said to be superior.

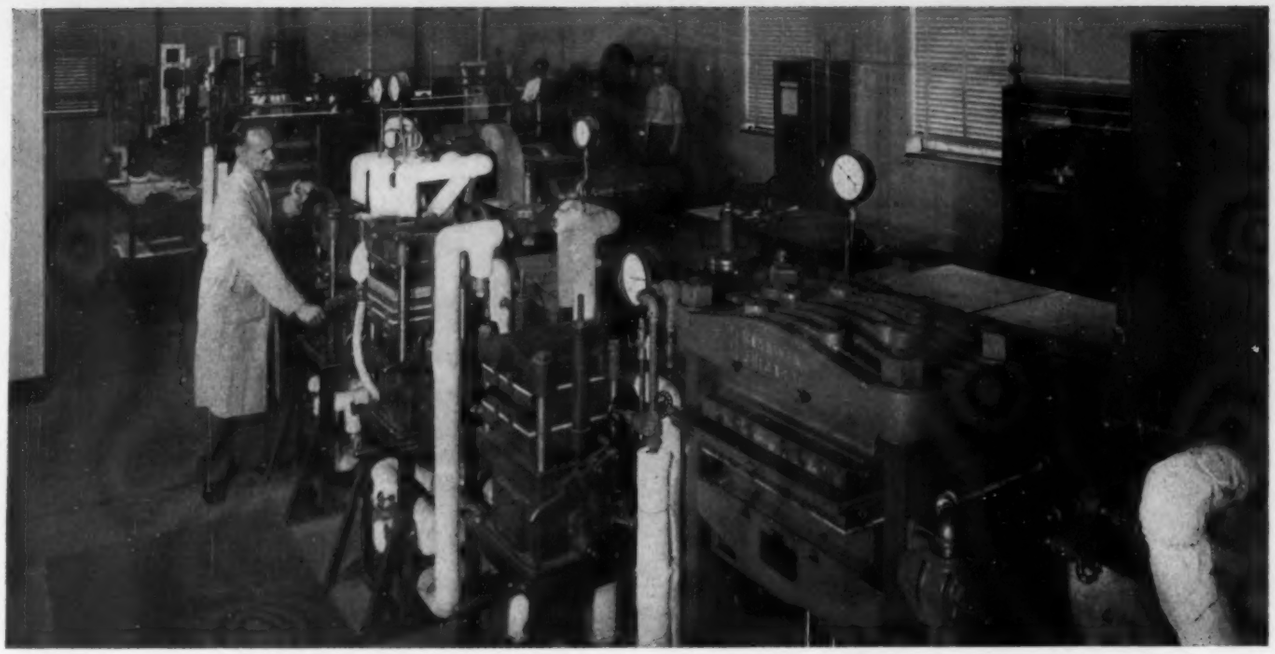


FIG. 1—General view of the rubber laboratory maintained by the Bell System at Murray Hill, N. J.

Bell Telephone's Rubber Research Laboratory

By F. S. MALM

RUBBER is used by the Bell Telephone System to insulate wires which are installed in the telephone plant in normal times by the millions of feet annually. It is also used for many other purposes including various types of soft and hard rubber manufactured in molded form or cut from rods, tubes or sheets for telephone apparatus. Much of this rubber is subjected to severe weathering and has to give long life under constantly changing conditions of temperature, humidity and light exposure.

The Chemical Laboratories of the Bell Telephone Laboratories, Inc., have for many years been actively

FIG. 2 (left)—Conventional open type mill.

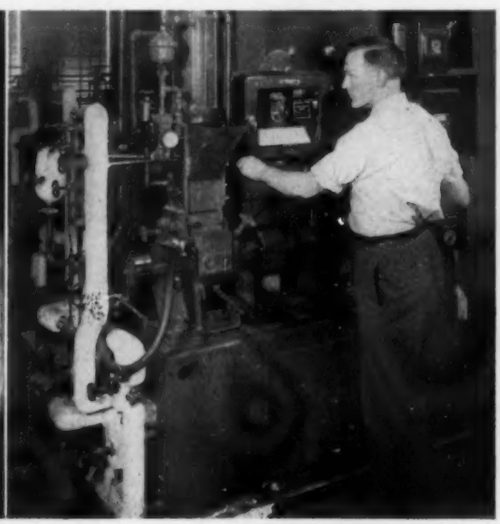


FIG. 3 (far right)—Laboratory closed type mixer.

FIG. 4—Covering machines and take-up for applying insulation to wire.

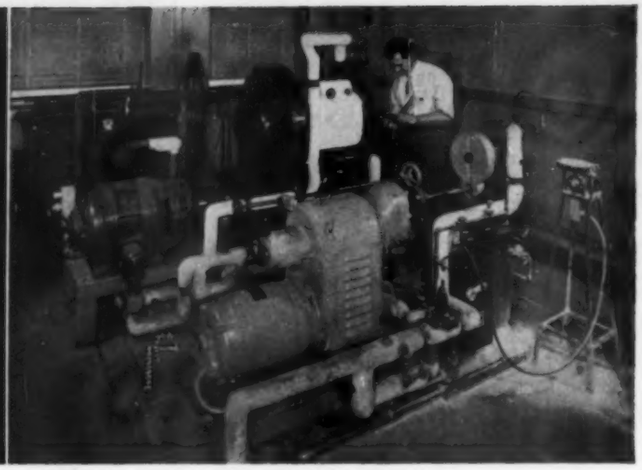


FIG. 5—Wire insulation is carefully gauged during covering operation.

engaged in research on the chemical and physical properties of rubber and its compounds, to determine the kind of materials required to withstand these severe conditions. Most of the work has been directed to improving insulating materials made from plantation rubber but an increasing part has been directed, during recent years, to synthetics such as Buna S and neoprene. This research work is being directed by A. R. Kemp, assisted by J. H. Ingmanson and the writer.

Extensive studies have been carried out on insulation for submarine cables leading to the development of Paragutta and pressure equalizing materials for loaded telegraph cables. Insulation has been developed for coaxial cables and more recently dielectric materials for ultra high frequency and microwave cables. Rubber jackets were also devised to protect against corrosion the transcontinental cable being laid between Omaha and Sacramento.

Recent loss of Far Eastern sources of supply of natural rubber has now forced an urgent problem on the rubber chemists of the Laboratory and their time is at present almost exclusively devoted to studying the properties of synthetic rubbers and their compositions for immediate needs.

About six months ago the rubber group moved to the new Laboratories at Murray Hill, N. J., where complete facilities have been provided for studying rubber and its synthetic substitutes and for improving them. In anticipation of a peak load in this work additional equipment was installed including mixers, vulcanizers and apparatus for physical and chemical tests. A view of some of the equipment for general use in the rubber laboratory is shown in Figure 1. A conventional open type mill is shown in Figure 2. The closed type of mixer is shown in Figure 3. Various compositions are prepared on these machines for making insulated wire, rods, tubes, sheets or molded parts.

All of this rubber working equipment is provided with auxiliary apparatus for controlling and recording temperatures, pressures and power consumption. The laboratory rooms are unique in that any of fifteen different services, including electric power, air pressure, vacuum, hot and cold water, hydrogen, oxygen and

FIG. 6—Battery of five hydraulic presses.

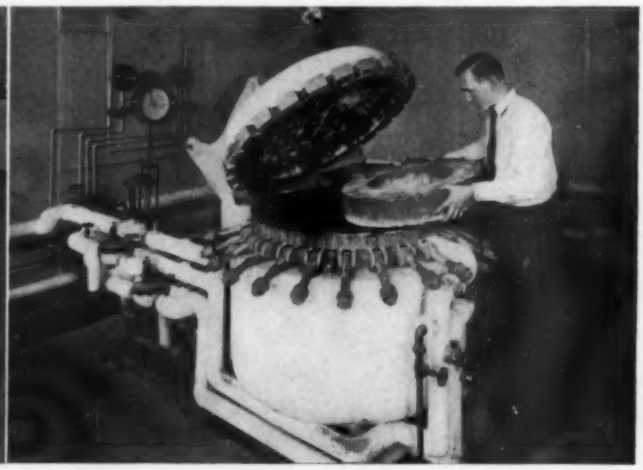
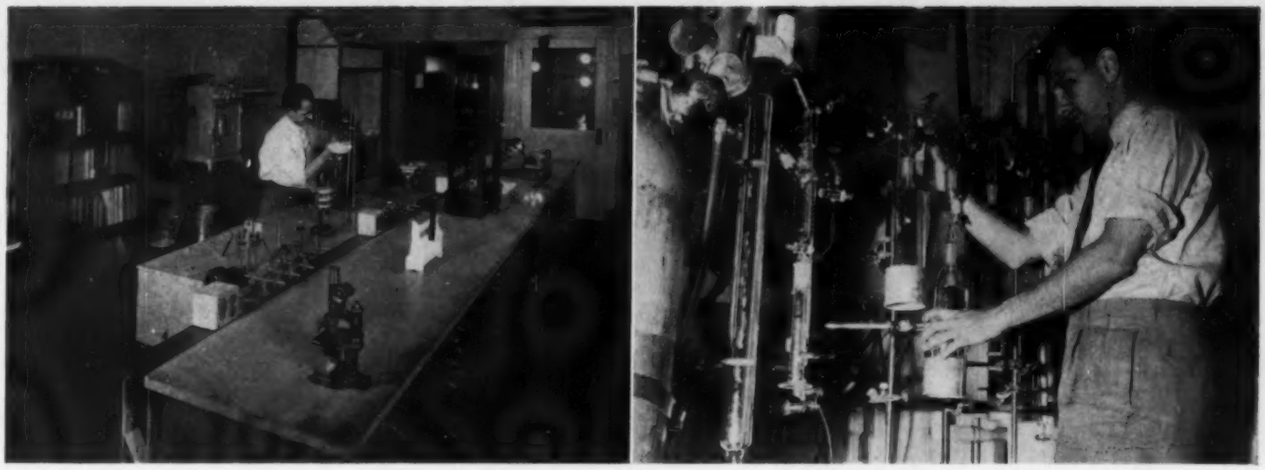


FIG. 7—Steam-heated vulcanizing equipment.



FIGS. 8-9—Properties of compounding ingredients are determined in these laboratories.

nitrogen, in addition to illuminating gas, are available at any bench or can easily be made so.

The extruding equipment shown in Figures 4 and 5 is used for making rods, tubes and insulated wire. For these items the compound is plasticized on a mill and fed into the extruding machine. When insulation is put on wire, a capstan is used to pull the wire through the sizing die. Two separate coverings can be applied simultaneously by using two machines in tandem. The extruders and capstan are driven independently so that varying screw and wire speeds can be obtained for the wide range of experimental work encountered.

A battery of five vulcanizing presses is shown in Figure 6. The four units to the left are used for the compression molding of finished parts. They are closed by rams and take conventional two part molds which are filled by hand with sheet material. The last one to the right differs from the others in that it has a ram on top so that it can force blanks of compound into closed molds and thus effect savings in mold cost and time of molding.

Insulated wire and many other products are packed in soapstone and vulcanized in steam heated equipment similar to that shown in Figure 7 or in high speed continuous vulcanizers as in factory practice. Hard rubber is plated with tinfoil and placed in a water bath during vulcanization.

Some of the synthetic rubbers are similar to the natural rubber in that they can be vulcanized by the addition of sulfur and accelerators and their physical properties improved by adding reinforcing pigments. Synthetics in general are not so workable as natural rubber and for this reason modifying ingredients are necessary to obtain satisfactory processing properties. Views of the laboratories where research pertinent to these problems is done are shown in Figures 8 and 9.

To improve the desirable characteristics of a rubber material and suppress the undesirable ones the rubber research organization endeavors to relate the physical characteristics of elastic materials to their molecular structure. Special apparatus is used in studying what happens to the rubber molecules when they are compounded, vulcanized and destroyed through use. These studies on the mechanism of vulcanization, viscosity,

FIG. 10—General physical testing equipment.

FIG. 11—Artificial weathering test machine.

molecular weight and brittleness of rubber and allied substances are associated with current synthetic rubber problems.

Equipment used for the general physical testing of rubber compounds is shown in Figure 10. These tests are made in an air conditioned room at 75°F. and 45 per cent relative humidity to insure uniform testing conditions throughout the year. On the right wall there is mounted a conventional 150-pound tensile machine with a compensating dynamometer head for testing dumbbell specimens stamped out from sheets. An inclined-plane tensile tester of 10-pound capacity which stands in the foreground is used for specimens of very small cross section. Behind this apparatus there is a compression machine, designed by the Laboratories for determining resistance of insulated wire to crushing loads and the shear resistance of sheet stocks. Along the left wall are two ovens. The nearer one is used for accelerated aging of rubber specimens and the other for plasticity and scorch determinations of various compositions.

Considerable replacement of rubber insulated wire and other equipment is required annually by the Bell System on account of weathering. Studies of the weathering of rubber and rubber substitutes are therefore conducted in the laboratory to correlate outdoor observations with experiments where the weather can be artificially controlled. Figure 11 shows the interior of the photo-chemical laboratory where rubber and allied materials are subjected to artificial weathering. The two machines in the rear each enclose an arc light of high intensity which simulates sunlight. The samples tested are rotated around the light and subjected to a spray of water at intervals. The apparatus in the foreground comprises a cage-like structure and a sunlamp. The cage supports samples of insulating materials and rotates them around the lamp for exposure to the action of light only.

These new facilities for rubber research at Murray Hill come at a particularly fortunate time because the available supply of natural rubber is rapidly decreasing and many problems relating to the production of synthetics are not yet solved. They make available equipment required in this critical emergency to investigate and improve the rubber substitutes on which our military and civilian needs must now largely depend.

Report of a Tension Roll Accident

A NEW employee, 18 years of age, was hired to work on a tandem calender operation. In between the two calenders was the usual type of tension rolls to take up the slack in the fabric. There were two rolls, 10 inches apart and 9-inch clearance from the floor, under which the fabric passed when traveling from the first to second calender. Centered above these two rolls was the tension roll which automatically maintained the proper tension on the fabric.

On his sixth day on the job the new man for some unknown reason kicked the fabric at the point where the fabric, while it was in motion, was passing under the second roll close to the floor. His foot was caught between the roll and fabric with the result that he could not release himself and was pulled downward between the adjacent roll only 10 inches away and between the roll having only 9-inch clearance from the floor.

The injured man yelled as soon as his foot was caught attracting the attention of two calender men who happened to be close by. They immediately pulled the safety but the injured man had already been pulled down between the rolls and floor. The injured man sustained a possible compression of the brain, bruised face with a fracture of his pelvis and ankle.

At the plant where this accident happened all new employees are cautioned and warned as to the hazards on calenders and any other jobs where any hazards exist. Since this accident occurred the plant supervision has made a survey and all operators have been reinstructed and cautioned as to the hazards on their particular jobs giving special attention to all newly hired employees.

News Letter, Rubber Section, N.S.C.

Plastac—A Processing Aid for Butadiene-Type Rubbers

A NEW MATERIAL, developed as a processing aid for all butadiene copolymer types of synthetic rubber, which serves as both a plasticizer and tackifier, has been introduced by the Advance Solvents & Chemical Corp., New York City. Called "Plastac," the new material is an oily liquid, is clear, dark amber in color, has a mild, pleasant odor, and a flash point above 100° C. Its specific gravity is 1.015 at 25° C.

As a plasticizer, Plastac is reported to give exceptionally soft stocks that calender, tube or process readily. Being an oily liquid, it is easily handled and can be incorporated in stocks quickly and efficiently. No obnoxious fumes are said to be present, either in the milling operation or in the vulcanization process. As a tackifier, the new material will produce an outstanding processing or plying-up tack, according to the manufacturers. This effect is said to be lasting, and will not decrease as the uncured stocks are allowed to stand or age, over several days at least.

Tests conducted by Advance Solvents indicate that Buna S, Hycar and Perbunan stocks containing 5 to 20% of Plastac have good resiliency. Aging properties and the rate of vulcanization are unaffected. Plastac does not bloom or sweat out of the cured stocks. In vulcanized compounds of these synthetics, Plastac tends to increase ultimate elongation and to slightly lower the modulus and hardness. Tensile strength remains at the maximum for the usual optimum cure conditions.

Division of Rubber Chemistry To Meet In Detroit, Mich., on April 15 and 16

THE Spring Meeting of the Division of Rubber Chemistry, A.C.S., will be held in Detroit, Michigan, on Thursday and Friday, April 15 and 16, in conjunction with the 105th meeting of the parent society. The Divisional meeting will feature the presentation of twenty-three papers, the long-anticipated Charles Goodyear Lecture by Dr. L. B. Sebrell, manager of the research department of the Goodyear Tire & Rubber Co., which was originally scheduled to be heard at the last meeting of the Division in Buffalo, a report from the Crude Rubber Committee, to be given by its chairman, George A. Sackett, now with the Faultless Rubber Co., and the regular Divisional banquet.

Following the trend of the times, practically all of the scheduled papers treat with synthetic rubbers and rubber-like materials. They are indicative of the concentrated research programs now devoted to these materials, the use of which will become mandatory in most cases in the near future. Although no special title has been given by Dr. Sebrell to his Charles Goodyear Lecture, it is presumed that it will be devoted in entirety to synthetic rubber. This lecture will be given on Thursday afternoon, April 15, while the report of the Crude Rubber Committee will be heard on Friday morning, April 16.

The banquet will be held at the Book-Cadillac Hotel on Thursday evening, April 15, and all those planning to attend the meeting are urged to secure their tickets as soon after arrival in Detroit as possible, since a capacity crowd is anticipated. H. J. Doering, of the Ford Motor Company, is chairman of the Banquet Committee. John T. Blake, of the Simplex Wire & Cable Co., chairman of the Rubber Division, advises that a prominent speaker or speakers may headline the banquet.

Although official headquarters of the Rubber Division will be maintained at the Book-Cadillac Hotel, all technical sessions will be held at the Detroit Masonic Temple, which has ample capacity and facilities for handling the large attendance expected. Abstracts of the scheduled papers, together with the authors and their company connections, follow:

Program of the
DIVISION OF RUBBER CHEMISTRY
AMERICAN CHEMICAL SOCIETY

Book-Cadillac Hotel—Detroit, Mich.
(Technical Sessions at Masonic Temple)
April 15 and 16, 1943

Thursday Morning—April 15

9:00 A.M.—General Papers.

Thursday Afternoon—April 15

1:30 P.M.—Charles Goodyear Lecture, by Dr. L. B. Sebrell of the Goodyear Tire & Rubber Co.
3:00 P.M.—General Papers.

Thursday Evening—April 15

6:30 P.M.—Division Banquet, Book-Cadillac Hotel.

Friday Morning—April 16

9:00 A.M.—General Papers.
11:45 P.M.—Report of the Crude Rubber Committee, by George A. Sackett, of the Faultless Rubber Co.

Friday Afternoon—April 16

1:30 P.M.—General Papers.
4:00 P.M.—Business Meeting.

ABSTRACTS OF PAPERS

Thursday Morning—April 15

9:00 A.M.—Introduction. ***John T. Blake (Simplex Wire and Cable Co.).***

9:10 A.M.—Thirty Years of Contributions to the Science of Synthetic Rubber. ***W. L. Semon (B. F. Goodrich Co., Akron, Ohio).***

This is the story of over thirty years of research and development on synthetic rubber in the laboratories of one of the large rubber companies. It tells of early work on the process for making butadiene from alcohol through the aldol process. This butadiene was then converted to rubber by treatment with sodium.

Commercial development of synthetic rubber had to wait upon progress in the related fields of antioxidants, accelerators, and carbon black.

Certain incidental and related outgrowths, such as rubber isomers and Koroseal, preceded the actual solution of the synthetic rubber problem. Finally satisfactory synthetic rubbers were developed and manufactured, as evidenced by the Ameripol tires and the commercial Hycar rubbers now being sold.

The outstanding progress already made in the development of synthetic rubber leads to some interesting predictions as to its future.

9:45 A.M.—Molecular Weights of High Polymers. ***Maurice L. Huggins (Kodak Research Laboratories, Rochester, N. Y.).***

The theoretical basis for the determination of average molecular weights by viscosity, osmotic pressure, cryoscopic, and other methods is reviewed. Certain common procedures are shown to be unjustifiable and to lead to erroneous "molecular weight" values.

It is proposed that the following be determined, for each type of polymer of interest: (1) the value of μ_1 (determining the concentration dependence of the osmotic pressure) for solutions of the polymer in a suitable solvent; (2) the value of k′ (determining the concentration dependence of the viscosity) for solutions of the polymer in a suitable solvent; and (3) the empirical curve giving the dependence of the "intrinsic viscosity" (in the same solvent)

on the molecular weight—using, for this determination, polymer fractions as nearly homogeneous, as regards molecular weight, as possible.

With this information available, a single osmotic pressure determination and a single viscosity determination suffice to determine "number average" and "viscosity average" molecular weights of a given sample. These two together give a much better characterization of the molecular weight distribution in the polymer than either one alone.

10:15 A.M.—Heat Generation in Rubber Due to Flexing. *S. D. Gehman, P. J. Jones, and D. E. Woodford (Goodyear Tire & Rubber Co., Akron, Ohio).*

A flexometer is described which is adapted for the accurate and rapid determination of the temperature rise in a rubber test piece due to flexing in compression. The vibratory driving force is secured by passing 60-cycle alternating current through a coil in a strong magnetic field. The test piece is run at this frequency with a set amplitude for ten minutes. The temperature in the middle of the piece is then measured with a needle thermocouple and potentiometer.

Curves are given illustrating the effect of amplitude, cure, pigment loading, and other factors on the temperature rise for natural rubber and for butadiene-styrene copolymer.

The principles involved in heat generation by flexed rubber as revealed by these experimental data and other vibration tests are discussed with a view to understanding the fundamental molecular or structural mechanisms involved. Comparison is made of the phenomena observed with rubber in this respect and theories of internal friction which have been found to apply in other cases. In its temperature dependence, internal friction in rubber acts like a liquid viscosity; in its frequency dependence, it acts like solid friction. The type of structure which may be responsible for these effects is discussed.

10:45 A.M.—Flex Life and Crystallization of Synthetic Rubber. *J. H. Fielding (Goodyear Tire & Rubber Co., Akron, Ohio).*

When natural rubber is stretched crystallization takes place in a degree depending among other things upon the amount of stretch. This is revealed by x-ray data and by thermal effects. A more important consequence of this is that the rubber becomes fibrous. It is strengthened in the direction of stretching and weakened in the other direction. This can be demonstrated by stretching, and then tearing across the grain and with the grain. It may be stated that rubber is reinforced by its own crystallization. A further proof is the fact that the flex life of rubber is extremely great when elongations are such that the test piece remains in the range of partial crystallization.

These effects are entirely lacking with GR-S but present in Butyl. It is felt that their absence explains to a large extent the low tensile of GR-S in non-black compounds, its poor flex life, and its susceptibility to tear and cut growth.

Data are presented particularly on tearing and flexing experiments. The tremendous flex life of natural rubber and Butyl while in a crystallized condition will be demonstrated, as compared with the lack of such behavior in GR-S.

11:05 A.M.—The Properties of Blends of Thiokol Synthetic Rubber Type FA with Neoprene GN, Hycar OR, and Perbunan. *S. M. Martin, Jr. (Thiokol Corp., Trenton, N. J.).*

Thiokol type FA is compatible with Neoprene GN, Hycar OR, and Perbunan. The properties of the blends vary with the ratio of the synthetics in the compound, but not always as a direct proportion.

Thiokol type FA swells less in aromatic blended fuels than the other synthetics and the diffusion of such fuels through FA is also less. The swell and diffusion characteristics of the blends are intermediate between that of the synthetics blended. However, this is not a straight-line relationship. The same characteristics hold for other solvents.

Other properties, such as tensile strength, elongation, tear resistance, resilience, and compression set show the same general trend.

The blends studied were made from a standard Thiokol type FA mix and similar compounds of the other synthetics containing no extractable plasticizer. The ratio of synthetic rubbers studied were 100/0, 90/10, 80/20, 60/40, 40/60, 20/80, 10/90, and 0/100. By plotting one property against variation in composition, trends are shown graphically. These data should serve as an indication of results to be expected from such compositions.

11:35 A.M.—Agripol, A New Chemurgic Rubber Substitute. *Andrew J. Snyder and Clinton A. Braidwood (Reichhold Chemicals, Inc., Detroit, Mich.).*

A brief background of the development of a rubber substitute, known as Norepol, by the Northern Regional Laboratory at Peoria, Ill. Norepol, an abbreviation from the names northern regional polymer, is defined as follows by the War Production Board: "A product capable of replacing rubber or reclaim for essential war or civilian use as approved by the War Production Board, comprising the reaction product of polyhydric alcohols with polymerized vegetable oil acids, or their derivatives, from which the monomeric acids have been substantially removed." Agripol, derived from the words agricultural polymer, is the RCI trade name for a product covered by the foregoing definition of Norepol.

The Northern Regional Laboratory admitted that the research work on the Norepol was nowhere nearly completed at the time of its first announcement. Due to the stress of war and the urgent need for rubber or a suitable substitute, it was felt, however, by the Northern Regional Laboratory that the cooperative efforts of a number of industrial laboratories and plants would be a much better procedure than trying to complete the research at Peoria.

Characteristics of Agripol, as compared to rubber, are enumerated. Charts illustrating some typical compounding of Agripol and the physical data obtained by this compounding are given. List of uses where Agripol is able to replace rubber as a satisfactory substitute. Industrial products made from Agripol will be shown.

Thursday Afternoon—April 15

1:30 P.M.—Charles Goodyear Lecture. *L. B. Sebrell (Goodyear Tire & Rubber Co., Akron, Ohio).*

3:00 P.M.—To be announced.

3:45 P.M.—A Laboratory Technique for Experimental Polymerization of Synthetic Rubber. *C. F. Fryling (B. F. Goodrich Co., Akron, Ohio).*

A 10-gram polymerization technique has been developed at the B. F. Goodrich Research Laboratories. With this technique there can be obtained not only the yield but also a polymerization curve showing the length of induction period, the rate of polymerization at any given time, and the yield of partially polymerized product at any desired time.

The type of latex produced and the extent of precipitation at any time during polymerization are quite easy to observe. The pH of the latex can be measured at the end of the process. Sufficient polymer is obtained for physical tests by the Garvey procedure.

This technique is particularly valuable for preliminary surveys which need to be made in the shortest possible time, and is also useful for raw material control.

4:10 P.M.—Vulcanization of GR-I (Butyl Rubber). *A. A. Somerville (R. T. Vanderbilt Co., Inc., New York, N. Y.).*

Tetramethylthiuramdisulfide (Tuads) is one of the better known accelerators for use in vulcanizing GR-I. Ordinarily 30 minutes or longer is required in a mold at a temperature of 300° F. to complete the cure.

It has been found that after 5 or 10 minutes the article may be removed from the mold and the cure finished satisfactorily in a hot air room at a temperature of 200° F., thereby giving greater production from molds and presses. Either Tuads or Selenac may be used in this method of curing.

Friday Morning—April 16

9:00 A.M.—The Conductivity of Rubber and Synthetic Rubber Tread Stocks. ***Leonard H. Cohan and Martin Steinberg (Continental Carbon Co., New York, N. Y.).***

Appreciable amounts of semiconducting rubber will be required for war applications where it is desirable to dissipate static electricity, such as in the case of shoe soles and flooring in explosive plants, landing gear on planes, etc. Due to the shortage of acetylene black, it will be necessary to use over ten million pounds of other types of carbon black for this purpose. In other cases it is desirable to have a low conductivity or high resistance stock. In this paper a general study of conductivity of typical tread type stocks of rubber and synthetic rubber has been made.

The conductivity of tread stocks of natural rubber, reclaim, Buna S, Neoprene GN, Thiokol N, and Butyl 1.5 has been studied. Conductivity depends primarily on the carbon black used in the tread stock. Standard channel blacks ranging from the extra soft type (particle diameter about 35 mu) to harsh type (particle diameter about 20 mu), special high conductivity channel blacks in the range of 10 to 15 mu in diameter, and acetylene black were used. For all the rubbers, resistance decreases sharply as the particle size of the channel black decreases.

Effect of aging and effect of swelling in naphtha on conductivity have been determined. In general, aging in an air bomb appears to increase resistance; however, the increase is not large. Absorption of naphtha greatly increased the resistance of all stocks. The increase for the channel blacks was, however, less than for acetylene black. After naphtha immersion conductivity of special channel blacks was markedly better than for acetylene black.

In some cases the high conductivity of acetylene black in rubber can be approached by special channel blacks. Results are also reported on an experimental channel black which when properly compounded is essentially equal in conductivity to acetylene black, far superior in tensile strength, but lower in plasticity and resilience.

9:20 A.M.—The Heat Resistance of Neoprene Type GN Vulcanizates. ***Don B. Forman (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.).***

In contrast to rubber, neoprene vulcanizates become harder when exposed to air for an extended time at high temperatures. This hardening can be minimized by fully curing all compounds and by properly selecting the basic components of the stocks. A neoprene vulcanizate that has not reached its maximum state of cure will rapidly harden during the initial hours of heat exposure because this period will be equivalent to an extension of the time of cure. When fully cured the neoprene vulcanizate does not show this rapid increase in hardness and consequently the degree of stiffening during heat exposure will be considerably less.

This is illustrated by extending the cure of Neoprene Type GN heat-resisting stocks from the usual 30 minutes at 287° F. to approximately 30 minutes at 324° F., or by using a strong accelerator, such as Permalux. Fully cured neoprene vulcanizates will be harder than those cured in 30 minutes at 287° F.; therefore adjustments should be made in the quantities of fillers and softeners used, so that original specifications can be met.

In compounding Neoprene Type GN stocks for heat resistance 2 to 5 per cent of an antioxidant on the polymer must be included. A combination of Neozone A and MUF gives excellent results. The oxides included as curing agents must be selected and used according to their effects on the vulcanizate after heat exposure. In general, the compounds should contain a minimum quantity of magnesia and a liberal quantity of litharge or zinc oxide. Combinations of the latter are frequently used. In practical applications FF wood rosin has been found to be beneficial.

The general effect of heat exposure on the properties of neoprene vulcanizates is also discussed.

9:50 A.M.—Effect of Time and Temperature of Cure on Properties of GR-S Tread Stocks. ***B. S. Garvey, Jr., and A. E. Juve (B. F. Goodrich Co., Akron, Ohio).***

GR-S tread compounds containing 1, 2, and 3 parts per hundred parts of GR-S, of sulfur, each with low, normal, and high acceleration (Captax—D.P.G.) have been cured for different times at 260°, 280°, and 300° F. Eight of the more important properties have been measured at each cure. Rates of cure are compared with respect to the different properties, the temperature of cure, the amount of sulfur, and the amount of accelerator.

10:30 A.M.—Simple Vulcanizates of Buna S and Sulfur. I. Physical and Chemical Properties. ***La Verne E. Cheyney (Goodyear Tire and Rubber Co., Akron, Ohio) and Arthur L. Robinson (B. F. Goodrich Co., Akron, Ohio).***

A series of vulcanizates composed only of Buna S and sulfur is described. These range from soft rubber types to hard products resembling ebonite. Analytical and physical data are presented for the members of this series.

The acetone extract, when calculated in terms of original polymer "as compounded", decreases to about one half its original value over the range from 0 to 35 per cent sulfur, and approaches a limiting value at the higher sulfur contents. This limiting value is assumed to represent nonpolymer material originally present. The remainder of the original extract is believed to consist of low molecular weight polymer fractions, which become progressively less soluble as the percentage of combined sulfur increases.

The stress-strain properties of these vulcanizates, when plotted vs. sulfur content, show little resemblance to those of the corresponding rubber products. The elongation decreases slowly from a moderate value in the soft products to a low value in the hard products. The tensile strength increases at the same time from very low values in the soft region to high values for the hard samples. The products of intermediate sulfur content are especially interesting, as they possess intermediate tensile strength and elongation. The corresponding rubber products are very weak and have low values of both tensile strength and elongation.

10:50 A.M.—Carbon Black in Butyl Rubber. ***L. B. Turner, J. P. Haworth, W. C. Smith, and R. L. Zapp (Esso-Laboratories, Chemical Division, Standard Oil Development Co., Elizabeth, N. J.).***

In the manufacture of most rubber articles pigments are employed, and of all the pigments the carbon blacks are the most important, being used in large volumes. The importance of the carbon blacks, especially the channel and furnace types, is the result of the enhancement of physical properties obtained by their use. This effect of carbon black and vulcanizates of either natural or synthetic rubber may be controlled by particle size, the chemical nature of the surface, or the "structure" of the black, either separately or in combination. Whereas in natural rubber compounds one of these may have been considered of primary importance, in the synthetic one of the others may be more important.

Since it is now necessary to replace natural rubber by synthetics, it is very desirable to know how they respond to different types of carbon black. This paper presents data obtained on Butyl rubber by varying the type and concentration of the black. The relation of the results to particle size and chemical nature of the surface of the different blacks is discussed.

11:20 A.M.—The Brittle Point and Shatter Point of Some Rubber-Like Compositions. *Glenn E. King (Johnson Rubber Co., Middlefield, Ohio).*

Upon cooling to low temperatures, many rubber-like compositions undergo changes in their physical properties. The shatter point occurs at a higher temperature than the bend brittle point. These points shift, although maintaining their relative positions, according to the synthetic, the type and quantity of plasticizer, and the time of freeze. Highly loaded stocks of high durometer hardness have a narrow temperature differential between the bend-brittle and the shatter point.

11:45 A.M.—Report of Crude Rubber Committee. *George A. Sackett (Faultless Rubber Co., Ashland, Ohio).*

Friday Afternoon—April 16

1:30 P.M.—The Evaluation of Butadiene in the Presence of Other Unsaturated and Saturated Gaseous Hydrocarbons. *J. F. Cuneo and R. L. Switzer (Union Oil Co. of California, Wilmington, Calif.).*

In this paper is described a butadiene analytical method, which is a departure from the usual maleic anhydride absorption technique, and which presents certain advantages in respect to convenience and accuracy.

The gaseous mixture is tested for total unsaturates by hydrogenating the sample. On another portion of the same mixture, the percentage absorbed by mercuric nitrate solution is ascertained. Regardless of the number of double bonds, the unsaturated gas is absorbed by mercuric nitrate as though it were an olefin. The difference between the percentage of unsaturates found by hydrogenation and that determined by mercuric nitrate absorption gives the percentage of unsaturates having more than one double bond.

This method has been tried on known blends made of normal butane, butadiene, and isobutylene in varying proportions, and all results have been found to be satisfactory. The same samples were analyzed for butadiene by absorbing the material in maleic anhydride, and a comparison of these results with those obtained by the method described is presented. In all cases the results obtained by the method described were in close agreement with the known values of the synthetic blends. An evaluation of the olefins and paraffins in a particular sample may be made by this method without further analysis. The results obtained by maleic anhydride absorption of butadiene were more time-consuming and, as a general rule, failed to check known values as closely as the method described.

2:00 P.M.—The Density of Carbon Black by the Helium Displacement Method. *R. P. Rossman and W. R. Smith (Godfrey L. Cabot, Inc., Boston, Mass.).*

Sufficient x-ray diffraction data are now available to permit a calculation of the limiting density of a few commercial carbon blacks. Values of from 2.18 to 2.20 are calculated. These values are considerably higher than the published experimental values. Carbon black densities have generally been obtained by pycnometric methods, using various liquids as the immersion fluid. These values are open to criticism on the basis of incomplete wetting of the pigment by the liquid.

In the present study a pycnometric method using helium as the immersion fluid has been employed to determine the density of commercial carbon blacks. The values obtained after a few hours' immersion in helium are only slightly higher than values obtained with the water pycnometer. These values represent the density of the "working particle" of carbon black and should be employed in practical application. The helium value, however, drifts for a period of some days, tending toward the limiting x-ray diffraction value. The rate and amount of helium diffusion depend upon the pore size within the "working particle". The sizes of the parallel layer groups comprising the "working particle" are nearly the same in all channel blacks. For acetylene black, however, these groups are considerably larger, giving rise to larger pores, and this and a pronounced helium drift indicate a considerable internal porosity.

The present work not only provides accurate density values but also adds support to the structure of carbon black as suggested by x-ray diffraction methods.

2:20 P.M.—Unsaturation of Butadiene and Related Polymers as Determined by Iodine Chloride Addition. *A. R. Kemp and H. Peters (Bell Telephone Laboratories, Murray Hill, N. J.).*

This paper describes procedures which have been developed to determine the unsaturation of polybutadiene, butadiene-styrene, and butadiene-acrylic nitrile copolymers. These methods depend on the use of *p*-dichlorobenzene for solution of the polymers and iodine chloride in carbon tetrachloride as the addition reagent, following the general technique employed in the standard Kemp-Wijs method for the determination of unsaturation of natural rubber. Data are presented showing a lower unsaturation in these polymers than would result from 1,4 polymerization of the butadiene.

A method is presented for determining the styrene and butadiene content of butadiene copolymers which is based on changes in the carbon-hydrogen ratio with varying proportions of coreacted monomers in the final product. The iodine value can also be employed to approximate the styrene content. It has been shown that the content of GR-S and natural rubber in mixed vulcanizates can be accurately determined by employing the new iodine chloride addition procedure together with the chromic acid oxidation method used to determine the natural rubber present.

2:50 P.M.—The Variation of pH Attributable to Phase Distribution in Synthetic Rubber Emulsion Polymerization Systems. *C. F. Fryling and E. W. Harrington (B. F. Goodrich Co., Akron, Ohio).*

During the course of emulsion polymerizations employing fatty acid soaps as emulsifying agents, a decrease in pH is observed. It has been found that a portion of this decrease can be attributed to a redistribution of the emulsifying agent from the organic to the aqueous phase. When a monomer, or presumably any other organic liquid exhibiting aqueous solubility, is added to a soap solution, within a definite range of pH, the pH of the system decreases to a minimum, at which point a second phase separates, after which on further addition of the monomer the pH rises. The minimum point can be used to determine the solubility of the liquid in the particular soap solution employed. The solubility increases as the soap concentration is increased. A tentative explanation is advanced, accounting for the observations in terms of the influence of solubilization and phase distribution on the hydrolysis of the soap.

3:15 P.M.—Effect of Petroleum Products on Neoprene Vulcanizates. IV. Effect of Gasolines. *Donald F. Fraser (E. I. du Pont de Nemours & Co., Wilmington, Del.).*

This paper and the preceding papers of the series show that the aniline point may be used as a criterion of the swelling effect on neoprene vulcanizates of a wide range of petroleum products. With those products having an A.P.I. gravity greater than 40 (kerosenes and gasolines) the Diesel index is preferred as a more precise criterion than the aniline point.

3:30 P.M.—Polar Compound-Treated Fatty Oils for Rubber. *Laszlo Auer (Ridbo Laboratories, Paterson, N. J.).*

It was found that fatty oils can be brought into various rubber-like stages, and that treating the fatty oils with polar compounds (for instance, electrolytes) at temperatures of about 250° to 320° C. and vulcanizing the so-obtained fatty oil products, materials can be obtained with greatly improved rubber-compounding properties (*I.R.I. Transactions*, April, 1929).

In a pure gum formula, polar compound-treated linseed oil preparations were tested, and compared with a com-

(Continued on Page 528)

Editorials . . . . . .

The Second Progress Report

DESPITE the fact that the second progress report to be issued by Rubber Director Jeffers (reproduced in full elsewhere in this issue) indicates that facilities for the production of only 241,000 long tons of synthetic rubber will come into bearing during the current year, as against an earlier estimate of 354,000 tons, and refers to the possibility that this country may be left with a stockpile of slightly over 100,000 tons by January 1, 1944, definitely too low for comfort, in our opinion the report is encouraging. This conclusion is reached on the basis that the report also indicates that the days of squabbling and arguments are over and the petroleum, chemical and rubber industries—each assigned a vital part in the overall program—have settled down to action rather than words.

Of course there have been innumerable delays, charges and counter-charges, arguments pro and con. Of course mistakes have been made and may continue to be made. But all one has to do is realize the immensity of the program and then must admit that it would be almost beyond human nature not to have followed the erratic course pursued in the first several months following Pearl Harbor. Mr. Jeffers frankly admits these past errors, but anyone reading the first progress report, and more particularly the second report, must get the feeling that we are now on solid ground. Additional controversial opinions will be raised in the months to come, but only an unusual circumstance will deflect the synthetic rubber program as now planned and being executed.

Rubber Director Jeffers has earned a reputation as being "tough." But he is also a shrewd, careful, cautious business executive, as the history of the Union Pacific Railroad, which he heads, in the past two decades proves. While there can be no argument with the facts presented in the second progress report insofar as requirements for 1943 are concerned, we suspect that moderation was the keynote of the supply situation. The capacity of the copolymer plants can be stepped up rather rapidly if the basic raw materials—butadiene and styrene—are available, and the probability is admitted that the butadiene and styrene plants will probably exceed their rated capacities. Then, too, it is estimated that only 35,000 tons of crude rubber will be imported during 1943, and the probability is that that figure is low by some 15,000 to 20,000 tons.

It should also be noted that the report has little to say about reclaimed rubber other than that "the production of reclaimed rubber has been increased in order more nearly to meet military and civilian requirements." As we have stated before, reclaimed rubber can step into the breach if any serious gap in available supply should develop. While the quality of essential military and civilian products might be somewhat below par in some cases if greater percentages of reclaim were used in stocks, nevertheless calamity would be averted. Reclaimed rubber was formerly called the "first line of defense." It is still an excellent backstop and sufficient supplies of scrap are now available to permit increased production at any time if the necessary manpower is made available.

Get in the Swim

THERE are still some manufacturers in the rubber industry who have not as yet experimented with any of the synthetic rubbers because of the fact that to date they have been receiving allocations of crude rubber due to the nature of products manufactured. In view of the fact that switchovers to one of the synthetic rubbers may soon become mandatory, we urge these manufacturers to use a little foresight and begin experimenting with the synthetics quickly. Manufacturers of dental supplies have already switched over to the synthetics and rubber drug sundries manufacturers will follow suit in a month or two. Other branches of the industry will soon be lined up. Any manufacturer desiring help in this connection will find that the so-called Educational Committee of the Office of the Rubber Director, headed by Dr. H. E. Simmons and John Ball, is ready and willing to lend a hand.

CURRENT NEWS OF THE MONTH

NEXT OCTOBER SEEN AS CRITICAL PERIOD IN JEFFERS' SECOND PROGRESS REPORT

ACCORDING to the second progress report made to the nation by William M. Jeffers, Rubber Director, issued on February 18 (which is reproduced in full elsewhere in this issue), the country will face the most critical rubber period between October, 1943, and March, 1944, with December of this year the low point. With increased military needs and civilian requirements for rubber this year estimated at approximately 612,000 tons, against supplies of 716,000 tons, America will be left with only 104,000 tons on hand next January. This will be considerably below the 120,000 tons which the Baruch Rubber Committee considered a necessary working inventory. This was the highlight of the second progress report on rubber to be issued.

As a result of delays in the synthetic program, Mr. Jeffers stated, the expected capacity that will come into production during 1943 will yield only 241,000 tons of all types, instead of the 354,000 tons which he had optimistically foreseen in his previous progress report, the first issued since he assumed the job of Rubber Director. It is therefore evident that only the barest minimum of rubber will be available for civilian use.

The Rubber Director's report contained no reference to the recent heated controversy over allocation of the critical components which the synthetic rubber plants must share with other major programs, including escort vessels and high octane gasoline.

Capacity of Butadiene Plants

It conceded what had been claimed in some capital quarters for some time; namely, that some of the large butadiene manufacturing units may ultimately have an output greater than their originally rated capacity. "It is possible," Mr. Jeffers declared, "that by the end of 1943 the alcohol butadiene plants may produce 55,000 to 110,000 tons more butadiene a year than their rated capacity."

Mr. Jeffers pointed out that approximately 440,000 tons of crude rubber were on hand in the United States and Canada on January 1 of this year.

"Many uncertainties," Mr. Jeffers said, "affect estimates of possible reports of crude rubber from various producing areas still in Allied hands, such as ocean transportation hazards, quality of rubbers produced and amounts actually to be harvested from the many programs now under way in various tropical nations.

"After estimating the quantities to be shipped to our Allies and taking all of the factors mentioned into consideration, it is expected that we can count on receiving, in terms of plantation crude, a new supply of 35,000 tons during 1943."

Mr. Jeffers reported that the synthetic rubber program eventually would produce 813,000 tons a year. This is the "rated capacity" of plants now planned. The capacity is 78 per cent of the amount recommended by the Baruch Committee, which placed the estimated annual need at 1,037,000.

According to the report three major problems are involved in the rubber program:

(1) To bring into production, as rapidly as possible, enough synthetic rubber capacity to balance supply and demand before ever-dwindling stocks have declined to a critical minimum.

(2) To maintain enough of the natural crude stockpile to make heavy duty military tires, self-sealing tanks, and other military items for which synthetic rubber is not yet adequate.

(3) Further to increase the capacity of the synthetic rubber industry and to develop all possible quick sources of natural rubber to take care of the additional needs in 1944. These 1944 needs include: Added requirements of our Allies as their inventories disappear; replacement of depleted inventories of necessary industrial equipment, most of which is used in the manufacture of military supplies; and replacement, during 1944, of essential civilian tires which, after recapping with presently available reclaimed rubber, will have worn out their carcasses by midsummer of 1944.

Definite Progress Reported

On March 2, some two weeks after making public his second progress report, Rubber Director Jeffers issued a statement to the effect that the rubber program is moving ahead smoothly under its new priority directive and that a small number of synthetic tires for civilians would be turned out by the end of this year, barring new obstacles.

He said that by the late Summer of 1944 the program of tires for civilians should be in full swing, and drivers would get a better grade of tire than originally believed.

Experiments with synthetic passenger car tires conducted in Texas and California are the basis for the optimistic outlook on tire quality, the Rubber Director said. When some remaining "bugs" were removed, synthetic tires might compare well with natural rubber.

Mr. Jeffers voiced confidence that the synthetic plants would be in production in sufficient time and volume to tide the country over the danger period late this year when the stocks of natural rubber on hand will dip low. Reclaimed rubber, the kind now going into civilian tires, is expected to last until synthetic production hits its stride.

Jeffers Reports to Nelson

Acting at the insistence of Rubber Director Jeffers, WPB Chairman Donald Nelson on March 1 amended his original order which provided that the Rubber Director, along with other WPB chiefs, report direct to Charles E. Wilson, recently appointed executive vice-chairman of the War Production Board.

The original order (Directive No. 2-79) was issued on February 18 and set forth the "functions and authorities" of the executive vice-chairman. It specified that the latter have the direction and supervision of "all staff services and operating units of the WPB," which automatically embraced the Office of the Rubber Director.

As soon as this order was issued, Mr. Jeffers asserted that under Presidential directive his office was made solely responsible to the chairman of the board of WPB and accordingly requested an amendment to the original order to clarify his position. This request was acceded to by Mr. Nelson by the issuance of Directive No. 2-80.

Committee to Study Needs

The creation of a special Combined Rubber Committee, to study demands of the United Nations for crude and synthetic rubber, was announced by William L. Batt, WPB vice-chairman and U. S. member of the Combined Raw Materials Board. The announcement was made on February 16.

The committee was created for the special purpose of obtaining, assembling and coordinating information on requirements and supplies of crude and synthetic rubber and to advise the CRMB

on suggested allocations between the United Nations so that the most economical use can be made of available supplies under a distribution system based on needs and production programs.

Members of the committee, which will operate in much the same way as the Combined Steel and the Combined Copper Committees, include: L. D. Tompkins and Stanley Osborne, of the Office of the Rubber Director; Enid Baird and P. M. Benton, of the Combined Raw Materials Board; and B. J. O'Donnell, of the British Raw Materials Mission.

New Orders on Rubber

Control over the consumption of crude rubber, latex, reclaimed rubber, scrap rubber or balata to fill war orders was further tightened this month by the issuance of Amendment No. 3 to Supplementary Order M-15-b, as Amended December 28, 1942. Under the amendment, the Director General for Operations of WPB and the Rubber Director are now permitted to issue special directives from time to time to limit such consumption, both as to extent and manner. The amendment was issued and effective March 1.

Amendment No. 4 to the same order, issued and effective March 5, removes Massaranduba balata and Peruvian F.A.Q. white balata which were not in deresinated form prior to March 5, 1943, from the restrictions of the order. These types of balata have been found unsuitable for use in the manufacture of products essential to the war effort. Importation of these types is controlled by General Imports Order M-63.

Official Wording of Order

The official wording of the amendment follows: "Balata" means any of the gums of recognized commercial grades having a gutta hydrocarbon base and a high resin content, procured from wild forest trees of the Mimusops genus and closely related genera generally found in South and Central America from the Amazon Valley north through Panama, and includes such gums whether in crude or refined (deresinated or partly deresinated) form; but does not mean or include scrap balata or reclaimed balata; or Massaranduba balata and Peruvian F.A.Q. white balata which were not in deresinated form prior to March 5, 1943.

SYNTHETIC RUBBER PROGRAM UNDERGOING STREAMLINING OPERATION

It is evident from actions by the War Production Board in recent weeks that the entire synthetic rubber program is being streamlined to conform to the top priorities recently granted to Rubber Director Jeffers as a result of his controversies with the Army and Navy. Several projects have been cancelled in the overall program, and a few others are slated for similar action in the immediate future.

On February 26 WPB announced that construction of facilities for production of butadiene in the refinery conversion plant of the Pan American Refining Corp. at Texas City, Texas, has been ordered stopped, and on March 8 similar action was taken on two additional butadiene plants, the Beaumont, Texas, refinery of the Magnolia Petroleum Co. of Dallas, and the Wood River, Ill., refinery of the Standard Oil Co. of Indiana.

In revoking preference ratings previously issued to the Pan American Refining Corp., WPB is said to have acted on recommendation of the Petroleum Administrator for War. Preference ratings for the project, which if completed would have cost $1,500,000, were issued last December. The Magnolia Petroleum project consisted of remodeling existing equipment and, if completed, would have cost $2,890,385, while that of Standard Oil involved both remodeling and new construction at an estimated cost of $15,004,800.

Recommendation for the cancellation of these three projects, according to a statement made by the Office of the Rubber Director on March 12, was made when it became obvious that some of the large butadiene manufacturing units would ultimately exceed their rated capacity and, on the other hand, shortages of components indicated that more recently approved plants could not be completed as soon as had been planned. Since the projects involved could contribute little or no butadiene this year, it was decided not to proceed with them.

Earlier, Mr. Jeffers revealed that the first large butadiene plant in the Government program at Institute, West Virginia, has been placed in production. This plant, operated by the Carbide & Carbon Chemicals Corp., has a rated capacity of 20,000 tons annually, and it is believed that it will exceed this output by a considerable amount. Four 20,000-ton butadiene units are scheduled at Institute, all of which will use alcohol as the base ingredient. The petroleum butadiene plant operated by the Standard Oil Co. of Louisiana at Baton Rouge, La., recently placed in operation, is expected to move into volume production shortly.

It has also been learned that the Standard Oil Co. of California has begun the construction of a butadiene plant under a letter of intent issued by the Defense Plant Corp. The project, located near San Francisco, is scheduled for completion by next July or August, and will cost approximately $6,200,000. The plant will probably use petroleum fractions, although no confirmation was given by company officials. Standard Oil Co. of California has formed the Oronite Chemical Co. The new company, which will confine its activities to the West Coast at present, will produce and market a wide variety of industrial chemicals of immediate importance to the war effort and later in the post-war market.

According to a WPB report issued on February 22, heat exchangers, one of the components which touched off the recent priority controversy between the Office of the Rubber Director and the Army and Navy, can be produced in sufficient quantity to meet all 1943 demands.

WPB officials said that by tight scheduling of production and by treating all the companies in the industry as a single firm in the apportioning of contracts and allotment of materials, the 1943 demands of approximately $200,000,000 worth of heat exchangers can be met.

A heat exchanger was defined as "an apparatus that exchanges heat between two or more fluids without allowing them to come into direct contact and intermix." The 100 manufacturers in the field produced in 1941 only about $65,000,000 worth. The materials required include steel plate, forgings and tubes and various forms of scarce copper and copper alloys.

Neoprene Units Cancelled

Contracts for two of the six 10,000-ton neoprene units at Louisville, Kentucky, were cancelled on March 24. The cancellations were first reported from Louisville and later confirmed by Deputy Rubber Director Bradley Dewey. Although the Louisville reports indicated that the cancellations had resulted from differences of opinion between Rubber Director Jeffers and Army and Navy officials over priorities, Col. Dewey attributed them to "purely technical matters of qualities of various synthetics and how they are used." Allocation of critical materials, he added, was definitely not a factor in the cancellations.

The neoprene units at Louisville, originally planned for independent operation by DuPont and later taken over and enlarged by the Government, were scheduled for operation in 1943 and early 1944. One unit is reported to have already reached 75% of its rated productive capacity and the additional plants would have practically doubled this production.

Lower Synthetic Rubber Prices

New prices for synthetic rubbers produced in Government-owned plants, to take effect April 1, were announced on March 8 by Price Administrator Prentiss M. Brown. They were agreed upon by Rubber Director Jeffers, Jesse Jones, head of the RFC, and the Price Administrator. The new prices and the higher prices which they supersede are as follows:

	New Prices (lb.)	*Present Prices (lb.)*
GR-S (Buna S)	36c	50c
GR-I (Butyl)	33c	35c
GR-M (Neoprene) ...	45c	65c

(EDITOR'S NOTE: As reported elsewhere in this issue, the price of several independently produced synthetic rubbers, including grades of Perbunan, neoprene and Hycar, have also been reduced in recent weeks).

At the same time it was announced that the selling prices of crude rubber distributed by the Rubber Reserve Co. will be based on 40 cents per pound for 1X ribbed smoked sheets for all uses other than civilian goods. Prices of scrap rubber sold by Rubber Reserve will remain at present levels at least until July 1, and therefore ceilings on reclaimed rubber and products made from reclaim remain unchanged. Present ceilings on rubber products for use of the Federal Government, however, will be revised shortly so as to reflect changes in the price of rubber.

Differentials between the new prices for the various synthetic rubbers and crude rubber were set in accordance with recommendations of the Rubber Director. They are designed to bring prices of these various materials into line with each other, taking into account differences in specific gravity and costs of processing. The Government stockpile of crude rubber is steadily diminishing, and production of synthetic rubber is increasing, thereby necessitating establishment of a closer relationship between the prices of these commodities.

Five New Alcohol Plants

Selection of sites for five new alcohol plants to operate on grain was announced on March 4 by the Chemicals Division of WPB. The sites are at Carrollville, Wisconsin; Dubuque and Keokuk, Iowa; and Moline and Peoria, Illinois. Plants on these sites are designed to produce a minimum of 36,000,000 gallons per year on a basis of recovery of feed values for livestock. The feed recovery program is being further studied jointly with the Department of Agriculture.

The minimum output from the plants on these new sites will bring the country's alcohol production to a point where all projected requirements can be supplied, including the heavy demands for synthetic rubber. At the same time, the recommendations of the Baruch Report for 100,000,000 gallons per year of new capacity will be substantially fulfilled by these plants and by new capacity which has previously been authorized.

The sites chosen have been selected after careful study of over a hundred possible locations and have been approved by the Rubber Director's office. The site survey was conducted by the engineering staff of the Alcohol and Solvents Section of the Chemicals Division and the United Engineers and Constructors, Incorporated, which was retained by the Defense Plant Corporation for this purpose. Consideration of location on navigable waterways near grain supply, transportation of alcohol by tank car, and available steam supply from existing boiler capacity were factors in determining the selection. Plants to be erected will be of special war-time design calling for a minimum usage of critical material.

Selection of operators for these plants will be made by the Chemicals Division with due consideration to recommendations of the Rubber Director's office. These selections will be announced in the near future.

Earlier, on February 25, the Department of Agriculture recommended construction of facilities for the production of industrial alcohol in the heavy grain-producing regions. The Department's position in this connection was revealed in a letter sent to the Senate Agriculture Subcommittee, headed by Senator Gillette, which has been investigating the synthetic rubber situation over the past several months, by Grover B. Hill, Assistant Secretary of Agriculture. Mr. Hill suggested using corn in the Corn Belt, grain sorghum in the Southwest, and wheat in the Pacific Northwest.

Charges that industrial alcohol and oil interests were seeking to block the construction of alcohol manufacturing facilities in farm areas were raised recently by Representative Mahon of Texas, who said WPB officials had thrown "obstacles" in the path of his efforts to obtain an alcohol plant near Lubbock, in the heart of the Texas grain sorghum region, and by Paul E. Hadlick, counsel for the agriculture subcommittee, who said he is "almost convinced that a conspiracy exists to prevent the building of more alcohol plants."

Synthetic Developments Abroad

Word has reached the Bureau of Foreign and Domestic Commerce at Washington, D. C., relative to the status of the French rubber industry. Manufacturers in France, due to lack of natural rubber, had to curtail operations drastically in the latter part of 1941 and it was not until early in 1942 that activity was resumed when, by virtue of an agreement with German authorities, sufficient supplies of synthetic rubber were obtained.

Under the agreement, each of the five principal French factories is coupled with a German firm. Each French firm grants certain advantages to its German correspondent, and in return buys German synthetic rubber, and receives all information necessary for fabrication of synthetic rubber. By a sublicensing arrangement, each of the five principal French firms, on receipt of payment, passes on the information to a number of other French firms.

The rubber situation in Sweden is reported to still be in the critical stage. Manufacture of synthetic rubber is apparently in the laboratory stage, and prospects for large-scale production are not clearly defined. Under terms of an agreement with Germany, Sweden was supposed to have received 200 metric tons of Buna during 1942 and is scheduled to secure 2,000 metric tons during the current year. This rubber will be manufactured into tires under license from the Continental - Caoutchouc-Compagnie. A new plant at Alfredshem near Ornskoldsvik in northern Sweden is expected to yield 200 metric tons of Thiokol-type rubber this year.

Charges Secret Agreement

The charges that an unpublicized reciprocal trade treaty proposed with South American nations to destroy all synthetic rubber plants in the United States after the war was the real reason for the reluctance of many companies in this country to start synthetic rubber production was made by William J. Hale, research consultant for the Dow Chemical Co., before the annual dinner of the Minnesota Bankers' Conference in Minneapolis on February 13. "We have signed an agreement in South America," Dr. Hale is quoted as having said, "saying all plants built to make synthetic rubber will be wrecked after the war."

There is "not the slightest foundation to this charge," according to Representative Stefan (Rep., Nebraska), who told the House of Representatives on February 24 that upon learning of the charge he communicated with the State Department and was advised that neither that department nor, to its knowledge, any other Government agency has "either entered into or proposed any agreement or understanding of any kind regarding the post-war status of the synthetic rubber industry in this country." It is understood that the State Department has requested an explanation from Dr. Hale of his statement.

Early Switchover Planned

Within two or three months synthetic rubber will begin replacing the small quantities of natural rubber now permitted in hot water bottles, ice bags and similar "Victory" line rubber drug sundries. The Office of the Rubber Director pointed out on February 22 that the result will be a definite improvement in many cases because of the greater resistance of some synthetics to acids, medicines, oils and greases. Dental supply manufacturers are currently switching over to the synthetic product. The so-called Education Committee of the Office of the Rubber Director, headed by Dr. H. E. Simmons and John Ball, paves the way for these planned switchovers.

Rubber from Lettuce

L. G. Goar of the College of Agriculture of the University of California recently disclosed that tests of three varieties of lettuce showed high contents of rubber latex. One wild variety, he reported, yielded 29% of latex from its stalk as compared with approximately 25% from guayule after three years growth. It has long been known that such common plants as lettuce contained some latex, but Mr. Goar's figures are higher than ever before reported.

CHANGES MADE IN SUNDRY, YARN, TIRE AND OTHER ORDERS

Amendments to orders affecting the manufacture, sale and pricing of various rubber products have been made in recent weeks, all of which are shown below under commodity headings for convenience.

DRUG SUNDRIES

As a result of evidence presented by manufacturers, OPA has transferred various baby and hospital articles from price control under regulations for rubber drug sundries to control under MPR 220 (Certain Rubber Commodities). The changes were made in Amendment 3 to MPR 300 (Maximum Manufacturers' Prices for Rubber Drug Sundries), Amendme..t 3 to MPR 301 (Retail and Wholesale Prices for Rubber Drug Sundries), and Amendment 4 to MPR 220 (Certain Rubber Commodities). All of the amendments were effective March 1.

The baby and hospital articles removed from the two drug sundries regulations and included in MPR 220 are hospital sheeting and blankets, pillow cases, baby bibs, baby pants, crib sheets, diaper and utility bags, diaper covers, mattress covers and coveralls, nursery hospital sheeting, and nursery seat rings. These products were removed from the sundries regulations because the manufacturers showed that they were made by a different industry from that devoted to rubber drug sundries—namely, coated fabrics—and the mark-ups for wholesalers and retailers differ accordingly.

Other changes in the rubber drug sundries regulations were made at the same time. They include provision for establishing a base price for products sold by distributors and manufacturers who assemble, finish or package drug sundries; in accordance with trade practice, for charges to be made for extension of credit by those who made such charges in December 1941; and for transferal of certain completed surgical and dental supplies from control by these regulations to control by Maximum Price Regulation No. 188.

FABRIC, YARN AND THREAD

Production, sales and use of elastic fabric, rubber yarn and elastic thread were put under complete allocation control by WPB on February 17 by amending Orders M-174 (Elastic Fabrics) and M-124 (Rubber Yarn and Elastic Thread).

As a result of the action, no elastic fabric or rubber yarn can be produced for or sold to the armed services, certain other government agencies, or to any other purchaser without specific authorization of the Director General for Operations. The sole exceptions are sales by or to the Defense Supplies Corporation. Previously, elastic fabric and yarn could be sold for specified government and lend-lease purposes without restriction.

The orders cover all types of rubber yarns (including synthetics) and elastic fabrics six inches wide and less which have been found suitable for use by the armed forces and essential civilian and industrial safety uses.

Rubber yarn and thread in a retail merchant's stocks on or before March 29, 1942, and elastic fabric which on June 20, 1942, had been packaged in the customary retail form are exempt from the orders.

INDUSTRIAL TIRES

Supplementary Order M-15-g (Rubber Tires for Industrial Power Trucks) was amended by WPB on February 17 to permit the use of Preference Rating Certificate PD-408 to acquire rubber tires for industrial power trucks. Several other changes were made in the amended order, including the following:

Replacement tires for industrial power trucks may not be delivered on a metal base band unless a similar band is turned over to the deliverer, or unless the base band is furnished by the buyer.

Each application for a preference rating on either PD-408 or PD-1A forms for a replacement tire must be accompanied by a certification that the tire is needed for replacement within fifteen days of the specified delivery date.

Persons who have been engaged in furnishing tires for industrial power trucks are permitted to have inventories not in excess of thirty-day needs, under certain restrictions.

Usable metal base bands for affixing tires must not be destroyed.

MISCELLANEOUS ORDERS

Maximum prices for sales of Pliocote by the Goodyear Tire & Rubber Co., Akron, have been established by Order 320 under G.M.P.R. These prices range from 36 to 44 cents per pound, depending on quantity. Pliocote is defined in the order as "a coated paper foil for packaging dehydrated foods, machine guns, machine parts for military use, and for similar purposes." The order was issued by OPA on March 8.

Administrative Exception Order 2 under Ration Order 6 (Men's Rubber Boots and Rubber Work Shoes), issued by WPB on February 24, permits the U. S. Rubber Co., New York, to transfer certificate-free certain types of rubber sport and dress boots which it could not dispose of under rationing control. These boots are not practical or heavy enough for industrial use and were therefore "frozen" in the company's possession. Other establishments having boots of a similar kind may also sell them certificate-free after meeting certain regulations laid down in the exception order.

RUBBER PROCUREMENT NOW IN HANDS OF RUBBER DEVELOPMENT CORP.

The big news in the crude rubber situation in the past month was the organization of the Rubber Development Corporation. This new organization was established on February 18 by order of the Reconstruction Finance Corporation at the suggestion of Rubber Director Jeffers. It will take over all activities concerned with the development and procurement of natural rubber in foreign countries formerly handled by the Rubber Reserve Co., as well as all activities of the Defense Supplies Corporation having to do with rubber.

It was made clear, however, that all matters relating to rubber within the United States, such as the development of synthetic rubber, the stockpiling and distribution of rubber, etc., will continue to be handled by Rubber Reserve. At this writing (March 10) the personnel of Rubber Development and Rubber Reserve, with some exceptions, has not yet been determined.

The Rubber Development Corp. is a direct subsidiary of the R.F.C. Its officers include Douglas H. Allen, president; J. W. Bicknell and Reed Chambers, vice-presidents; and W. L. Clayton, Assistant Secretary of Commerce, chairman of the board. These officers, in addition to T. Ross Cissel, of the State Department, and H. Clay Johnson, R.F.C. counsel, form the board of directors.

The new organization, which is located in the Normandy Building, 1626 K St., N.W., Washington, D. C., headquarters of the former Wild Rubber Division of the Rubber Reserve Co., which was headed by Mr. Bicknell, assumes all responsibilities and rights of Rubber Reserve under the rubber agreements which have been negotiated with 16 Latin American countries. The transfer of activities to Rubber Development will in no way involve any change in operations under these agreements and represents, in general, action of a formal nature to simplify such operations.

E. G. Holt, former chief of the Leather and Rubber Division of the Bureau of Foreign and Domestic Commerce, and P. W. Barker, former analyst of the same division who more recently has been associated with the War Department, are both associated with the new Rubber Development Corp.

Latin American Developments

According to semi-official reports, shipments of crude rubber from Latin America are reaching the United States in encouraging amounts. Several countries give indication of supplying a far greater

share than early predictions and every effort is being expended by the authorities to maintain this trend. The following reports, received in recent weeks, are especially interesting:

Argentina: Government restrictions controlling all use of rubber and giving a special committee authority to expropriate rubber stocks went into effect on February 22. Factories maintained by Goodyear, Firestone and Michelin were authorized to use their current supplies exclusively for tire manufacture and are now required to report to the rubber distribution committee each month. The committee can expropriate raw rubber needed for the manufacture of articles in the following order of importance: Articles essential to national defense; articles required for sanitary medical uses; containers for meat and other perishables for the export trade; and articles which are considered indispensable in an emergency.

Brazil: A chain of rest stations is reported to be rising across northern Brazil along the route of workers trekking into the Amazon Basin gateway of Belem. These workers are being assembled in northeastern Brazil for transportation to Belem and thence by boat into the Amazon basin. Construction of twelve rest stations are underway, seven of which will serve as centers to prepare the workers for their march, the remaining five being located at intervals along the route to Belem.

Joao Alberto Lins de Barros, Economic Coordinator of Brazil, has forecast production of approximately 75,000 tons of rubber in 1944. This is the highest estimate yet made officially since production was stimulated by the special agreement with the United States. The Coordinator stated that production in 1942 reached 20,000 and calculated output in 1943 at 45,000 tons.

Colombia: A fleet of floating hospital-dispensaries for care of rubber tappers in the upper Amazon forests of Colombia is one of the projects mapped out for the inter-American health and sanitation program in that country, according to a report made to the Office of Inter-American Affairs. The idea is similar to that being carried out on the Amazon and its tributaries in Brazil where a fleet of fifty floating dispensaries is being organized to carry doctors and medical supplies for the thousands of tappers now being brought into that area. The larger floating installations planned for Colombia will consist of a launch to tow a hospital with 8 or 10 beds.

Costa Rica: According to J. L. Apodaca, special agent of the Rubber Reserve Co., Costa Rica may export 600 tons of rubber this year or nearly three times its 1942 exports, reported at 225 tons, some 215 tons of which were shipped in the last six months of the year. Rubber Reserve began its work in the country about June, 1942, and has been active ever since.

Peru: A new agreement has been signed between Peru and the United States providing for an air transport system to carry rubber from that country's inland jungle to various river and sea ports. The agreement was signed in Peru on February 19. An unofficial estimate has placed rubber production in Peru beyond 800 tons for 1943 and above 1,500 tons in 1944.

Venezuela: The United States will not receive any rubber from Venezuela this year if estimates of production made on February 23 by Minister of Agriculture Rodolfo Rojas are correct. Total production for this season, which ends in April, will amount to only 100 tons. Production for the next season, which begins in October, is expected to exceed 1,000 tons. The contract between the United States and Venezuela provides for the retention by the latter country of 800 tons per year, the excess to be sold to the United States. It was pointed out that Venezuela has not exported any rubber for over 20 years. The difficulties of getting the rubber out were also emphasized.

OVER 11,000,000 TIRES SECURED BY IDLE TIRE PURCHASE PLAN

According to a statement issued by Jesse Jones, Secretary of Commerce and head of the Reconstruction Finance Corp., on March 4, more than 11,000,000 tires and tubes were secured as the result of the so-called Idle Tire Purchase Plan inaugurated by the Defense Supplies Corp., an RFC subsidiary, last October. Federal Reserve Banks have already sent out more than 2,500,000 checks and acknowledgments of gifts to owners having turned in their tires and tubes.

In an earlier explanation of the distribution of these tires, Mr. Jones stated that the Government sells the tires to manufacturers but ships them, freight prepaid, directly to dealers designated by the manufacturers. The latter order only tires for which they in turn have received orders from dealers, accompanied by rationing certificates issued by OPA. The manufacturers honor orders received from any dealer, even though he may not have been a regular customer, and in this manner the Government is assured that the tires will become available immediately in retail stores.

The Government sale price, Mr. Jones stated, is the retail ceiling price as determined by Government appraisers, less cost of repairs if any are needed, less 44%. Of this 44% not less than 30% is allowed to the dealer. The dealer thus has a margin of only $2.00 to $3.00 on each tire, since most of the tires turned in were used tires, whereas the normal dealer margin is closer to $5.00 per tire. The 14% allowed the manufacturer is substantially less than his normal margin.

Tire Quotas for March

A reduction in the quota of truck tires for March as compared with February, the figures being 299,000 and 345,122, respectively, was announced by OPA on February 26. Recapping services for truck tires were increased from 345,065 to 460,000, while truck tubes dropped from 298,935 to 292,100.

The March quota for Grade I tires was 321,827, as compared with 161,000 in February, and that for Grade II tires was 253,000, against 225,500. Only 644,000 Grade III tires were allotted in March, against 690,475 in February. The March tube quota for passenger cars was 735,914, as compared with 759,000 in the previous month. The figure for farm tractor and implement tires was 59,800 in March, against 57,961 in February.

Since recapping with passenger type camelback is no longer rationed, as reported elsewhere in this issue, no passenger car tire recapping quota was assigned for March.

Amendments to Tire Order

Five additional amendments to Ration Order 1A (Tires, Tubes, Recapping and Camelback) have been issued by OPA since our last issue, as follows:

Amendment No. 11, issued February 13 and effective February 15, enables tire dealers whose stocks of tires, tubes or recapping material are not large enough to serve their customers to fill their requirements by buying from other dealers who wish to reduce inventories. Procedure by which a dealer may replace lost, stolen or destroyed tires, tubes, camelback, or replenishment portions of rationing certificates is also outlined in the amendment which also provides that any person, upon written authorization from WPB, may transfer tires and tubes to an equipment or vehicle manufacturer for use as original equipment.

Amendment No. 12, issued February 19 and effective February 20, removes rationing restrictions on the recapping of passenger car and light truck tires with passenger-type camelback. Tires smaller than 7.50x20 may be recapped with reclaimed rubber camelback without application to local rationing boards for certificates. Recapping of commercial vehicle tires with truck-type camelback, which contains a large percentage of crude rubber, continues subject to rationing restrictions. Recapping, it was pointed out, requires about half as much reclaimed rubber as the new "war tires."

Amendment No. 13, issued February 27 and effective March 1, designates all-reclaim "war tires" as Grade II casings, instead of Grade III casings as heretofore, thus reserving them for cars with a mileage ration of more than 560 miles monthly. Another change provides that the section of the regulations under

which dealers get original allotments of used tires will be withdrawn on March 15. There are now two ways by which dealers can get used tire allotments, one providing for obtaining used tires alone and the other for a stock of Grade III tires. After March 15, only the Grade III provision remains. The amendment also permits a dealer who holds a replenishment portion of a rationing certificate calling for a tractor-type of implement-type tire to restock with any size Grade III casing instead, if he so wishes.

Amendment No. 14, issued February 27 and effective March 1, provides that tires, tubes, and recapping material continue to be rationed in territories and possessions of the United States on the same basis as at present pending completion of studies to determine what changes, if any, are needed. These areas now operate under the Revised Tire Rationing Regulations and not under Ration Order 1A as in the Continental United States. Changeover to Ration Order 1A was scheduled to go into effect in the territories and possessions on March 1, but this effective date is withdrawn by the amendment and the Revised Tire Rationing Regulations remain in effect until further notice.

Amendment No. 15, issued and effective March 2, sets up new regulations for review by hearing commissioners of appeals made on rationing decisions by local boards. The authority of regional administrators and state directors to revoke certificates is also clarified.

Revised Price Schedule No. 63

Two new amendments have been issued to Revised Price Schedule No. 63 (Retail Prices for New Rubber Tires and Tubes), as follows:

Amendment No. 7, issued February 13 and effective February 19, adds brands of 47 distributors of new passenger car and truck tires and tubes to lists of brands covered by specific maximum retail prices for base sizes. The addition will enable these distributors to determine the maximum retail prices for all sizes of their tires and tubes more precisely than formerly by setting each price, other than those for basic sizes, in a prescribed relationship to a specified base size price.

The same amendment also included three other changes: (1) Since prices for all retailers of a given brand must be the same, the requirement that retailers report their maximum prices to local rationing boards is eliminated; (2) It is no longer required that certain items be set forth separately in lists of maximum prices that dealers must post in their places of business; (3) In the formula for computing prices in relation to those for specified base sizes, specific provision is made as to the size the distributor should employ for reference when he does not have a brand of the usual base size.

Amendment No. 8, issued March 1 and effective March 6, establishes specific maximum retail prices for several sizes of brands of truck tires of Dayton Rubber and U. S. Rubber, and for a quantity of passenger car inner tubes of the Polson Rubber Co. The truck tire retail prices for the products of Dayton Rubber and U. S. Rubber cover new sizes or brands which did not appear on their November 25, 1941, lists.

The Polson tubes represent a lot which the company wants to rebrand and sell to the Firestone Tire & Rubber Co. Maximum prices for the sale of these tubes by Polson to Firestone and maximum wholesale prices for the sale of the tubes by Firestone and by wholesalers who handle them subsequently were established in Order No. 1 under MPR 143 (Wholesale Prices for New Rubber Tires and Tubes), effective March 6.

Repaired Tires and Tubes

Minimum quality specifications for used tires and tubes need not apply to tires and tubes repaired in accordance with written permission of the Office of the Rubber Director, according to Amendment No. 9 to MPR 107 (Used Tires and Tubes), issued by OPA on February 18. The action was taken in order to cooperate further with the experimental program sponsored by the Office of the Rubber Director for reclaiming more used automotive tires and tubes.

The amendment specifies that the retail purchaser of one of the tires or tubes covered by it shall be given, on a sales slip or otherwise, the written statement: "Experimental tire (or tube). Keep this slip to identify the tire (or tube)." The slip must identify the tire or tube clearly, by serial number, brand name, and by any other pertinent description.

Average Annual Mileage Reduced

Mileage rationing has reduced the national average of American passenger cars to 5,400 miles annually without eliminating essential transportation, Price Administrator Prentiss M. Brown announced on March 3. The announcement was based on a study of rationing board records of 80 representative counties and the figure reflects a mileage reduction achieved previous to the non-essential driving ban applied in the East on January 7. The Baruch Rubber Report recommended a 5,000-mile-a-year limit.

Interchemical Acquires Cotan

The Interchemical Corporation of New York City has acquired substantially all of the stock of the Cotan Corporation, 331 Oliver St., Newark, N. J. The personnel of the Cotan Corp., formerly known as the Cotex Corp., is being retained, with C. T. Melvin as president and R. F. Lewis as vice-president. Cotan has been engaged in the manufacture of coated fabrics of the type used for upholstery, handbags, theatre seats, automobiles, etc. It recently has been producing raincoat fabrics and other coated fabrics for the armed forces.

GENERAL CABLE CORP. OFFERS ROYALTY-FREE LICENSES TO U. S.

The General Cable Corporation has offered the Government a royalty-free license under all of its patents covering numerous types of wires and cables vital to the war effort for the duration, according to an announcement by Dwight R. G. Palmer, president, on February 25. Under the terms of the offer, the Government would be enabled to place orders with concerns having manufacturing capacity regardless of whether or not they are licensed. This will open up new outlets for the arms of the military services whose wire and cable requirements have been steadily mounting.

In addition, it was pointed out, the offer will save the Government considerable sums of money in its purchase of vital wiring, since royalty payments by General Cable licensees fulfilling war orders will no longer be required and the resulting saving will be passed on in full to the Government.

The royalty-free license which would be granted the Government for the duration, Mr. Palmer said, would apply to all wire and cable sold to the Government directly or indirectly through contractors or subcontractors.

Explaining the offer, Mr. Palmer stated that it had always been General Cable's policy to grant licenses to other manufacturers upon payment of reasonable royalties. The decision to suspend this payment on war orders was reached to effect savings in price to the Government, and at the same time to encourage opening up new sources to help fill the demands made by modern warfare on the wire industry.

Mr. Palmer also announced that General Cable Corporation is taking steps to eliminate from all of its patent license agreements the corporation's right, wherever it exists, to establish prices, terms, and conditions covering sales of patented wires and cables by its licensees. He also said that royalties, wherever they remain payable, will be based upon invoiced selling prices exclusive of transportation charges.

Despite the fact that acceptance of the General Cable offer by the Government will result in the loss of royalty income formerly devoted to research and development, Mr. Palmer declared that the corporation is increasing its expenditures for research and the development of new products in furtherance of the war effort.

Confirmation of the sale of some of the equipment and machinery from its Pawtucket, R. I., plant to the Corporacion de Fomento de la Produccion, an instrumentality of the Government of Chile, was recently confirmed by General Cable. Transfer of the equipment will make Chile self-sufficient in respect to wire and cable which it formerly imported. It was stressed, however, that the sale of the equipment will not affect either employment or production at the Pawtucket plant.

BUFFALO RUBBER GROUP HEARS TALK BY DR. LE BEAU OF M.I.T.

Dr. D. S. le Beau, research associate at the Massachusetts Institute of Technology, who has been closely associated on development work in the fields of guayule and reclaiming of synthetic rubbers with Dr. Ernst A. Hauser, professor of colloid chemistry at the Institute, was the principal speaker at the joint meeting of the Buffalo Group, Rubber Division, A.C.S., and the Western New York Section, A.C.S., held at the Prospect House in Niagara Falls, N. Y., on February 18. Approximately 180 members and guests attended the meeting. The dinner and meeting were preceded by a cocktail party held in honor of the speaker.

Dr. le Beau was born in Poland, studied at the University of Vienna, and was awarded her Ph.D. by the University of Graz in 1931. She entered the industrial field as a research and development chemist at the Austro-American Rubber Works Co. in Austria, but later went to Paris to become consulting chemist for the Societe de Progres Techniques. In 1936 Dr. le Beau came to the United States and took a position with the Dewey & Almy Chemical Co. and in 1940 was made a research associate at M.I.T. where she was put in charge of a long-range project on the reclaiming of rubber with emphasis on synthetic rubbers. In this work, she has been closely associated with Dr. Hauser.

In her address, Dr. le Beau spoke principally on the importance to the nation's rubber supply and production of guayule, reclaim and the synthetics. She described in detail, and with graphs, the important aspects of the work on de-resinifying and compounding guayule which she has been carrying out at the Massachusetts Institute of Technology. Much of the work done has been concerned with efforts either to de-resinify more quickly or economically, or to compound the commercially deresinified guayule in such a way as to negative the deleterious effects of the average 25% resin found in guayule.

Reclaim, as stated by the speaker, is the first line of defense, and the emphasis of all our experimental work must be placed on speed, but certainly not on speed if detriment of quality will result. It is to our great disadvantage, and perhaps a bit to our shame, that we have been "cooking" rubber for fifty-odd years in the reclaiming processes and, as yet, we do not have a clear knowledge of what actually takes place in the reclaiming process. In spite of this, it is possible to get 10,000 miles out of a good reclaim tire today. Dr. le Beau mentioned that it would not be too optimistic to expect 20,000 miles from the same tire if we knew better how to reclaim rubber without destroying many of its valuable properties.

Dr. le Beau discussed the present situation of the synthetics mainly from a standpoint of factory production and deplored the lack of basic knowledge of the basic structures. She pointed out that a great handicap in studying the molecular structures of the synthetics has been the impossibility of using the tool which has given us so much information about natural rubbers—the X-ray. With the problems attendant upon the first use of synthetics in the factory, it is easy to see that when three years ago M.I.T. was asked to work on the problem of reclaiming synthetics, seemingly impossible problems were presented to the research

Dr. D. S. le Beau

workers. Chiefly among the requirements of such a reclaiming process were: (1) It must be cheap; (2) present equipment must be used; and (3) the process must successfully reclaim natural and synthetics. Dr. le Beau stated with regret that details of the process, though extremely interesting, could not be divulged due to the emergency. A long and interesting discussion followed the presentation of the paper.

Another feature of the meeting was the presentation of an after-dinner talk on "Perfumes in War Time," by Earl Booth of the Larkin Co. Mr. Booth discussed the expediencies which the perfume chemist had to adopt in war time to carry on a non-essential business. A voluminous collection of rare and synthetic perfumes was displayed by the speaker.

It was generally agreed that the joint meeting was so successful that according to Burt Wetherbee, of the Globe Woven Belting Co., chairman of the Buffalo Group, the possibility of its becoming an annual affair are extremely favorable.

An excellent booklet designed to provide a helpful and clear conception of Government rulings on war-time rubber footwear, rubber, rationing, and the resultant changes in selling tactics, has been introduced by the Hood Rubber Co., Watertown, Mass., under the title, "Wartime Rubber Footwear Reference Book and Catalog."

ONTARIO GROUP HEARS PARRISH; ELECTS OFFICERS FOR 1943-44

W. D. Parrish, of the Hycar Chemical Co., Akron, Ohio, was the principal speaker at a meeting of the Ontario Rubber Section of the Canadian Chemical Association, held in the Chemical Building of the University of Toronto, Toronto, Ontario, Canada, on March 10. As usual, the meeting was preceded by dinner at Hart House.

Mr. Parrish discussed the compounding and characteristics of Hycar OS-10 and Hycar OR-15, as well as those of Hycar OR-25. He presented numerous slides indicating test results obtained in the Hycar laboratories and answered several questions raised as a result of his address. Mr. Parrish was thanked for his address on behalf of the group by R. G. Stewart.

The election of officers for the 1943-44 season resulted in the following: *Chairman,* John Ramsay, Gutta Percha & Rubber, Ltd.; *Secretary-Treasurer,* Harold Deline, Dunlop Tire & Rubber Goods Co.; *Executive Committee,* R. M. Ferguson, Naugatuck Chemicals, Ltd.; J. W. Holmes, Polymer Corp., and M. L. Johnston, Canadian General Rubber Co.

Montreal Hears Dr. Galley

Dr. W. Galley, chief of the Colloid and Plastic Section of the National Research Council, Ottawa, was the principal speaker at the meeting of the Rubber & Plastics Division, Montreal Section, Society of Chemical Industry, held at the Faculty Club in Montreal, Canada, on February 12. Dr. Galley, who has made a life-time study of adhesives and has been instrumental in the development of laminated wood sections for airplanes, discussed "Modern Developments in Adhesives, Coatings and Laminates." One interesting point brought out was that several laminates are now being made which have physical properties equal to any known metal alloys on a weight basis.

The group was also scheduled to hold a meeting at the Ritz-Carlton Hotel in Montreal on March 12, with John D. Benedito, of Canadian Resins & Chemicals, Ltd., scheduled to speak on "Vinyl Resins." A report of this meeting will appear in the next issue.

The group will also hold a meeting in Montreal on April 9 when H. K. Nason, assistant director of research of the Monsanto Chemical Co., Springfield, Mass., will speak on "Developments in the Functional Utilization of Plastic Materials."

"Rub-r-Less" Wire, designed as a substitute for rubber insulated wire under conditions stated in Interim Amendment Nos. 44 and 69 covering Section 3005 of the N. E. Code, has been introduced by the National Electric Products Corp., Pittsburgh, Penna. The new wire features cellulose-acetate butyrate (Kodapak No. 2) insulation.

ACCELERATORS IN BUNA S THEME OF CHICAGO MEETING

Approximately 120 members and guests at the meeting of the Chicago Group, Rubber Division, A.C.S., held at the Morrison Hotel in Chicago on February 12 heard Dr. Arthur M. Neal of the Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, deliver a paper on "The Use of Accelerators in Buna S." The talk was most informative and drew considerable discussion.

Dr. Neal predicted non-sulfur accelerators of GR-S in the near future, although to date the best results are obtained from the various well-known types of accelerators used in natural rubber compounding. He said that in the light of present laboratory investigations, sulfur combines chemically with GR-S (Buna S) much the same as in the case of natural rubber, but smaller sulfur ratios are required and the range of sulfur combinations is narrower. There are also indications, he stated, that a more sensitive balance between the accelerators and sulfur is required.

In discussing the various types of accelerators which may be used with GR-S, Dr. Neal pointed out that the basic accelerators, such as the guanidines and the aldehyde-amine types, are weak accelerators but good activators. The acidic accelerators, such as MBT, 2MT and sulphine amides, are an important class. These are susceptible to activation with basic type accelerators and they give more processing safety than when used in natural rubber. The thiurams, he said, are rapid, safe, give good tensile strength, good elongation and tear resistance, and have a flat curing curve. They can be used as either primary or secondary accelerators.

Continuing his discussion, the speaker said that the criterion of a good accelerator depends upon the properties of the resulting vulcanizate. He presented a series of slides showing representative compounds using various types of acceleration and the properties obtained in the resulting vulcanizates. In concluding his address, Dr. Neal cautioned rubber technologists against relying too much upon their rubber experience in the formulation of GR-S compounds. (EDITOR'S NOTE: Dr. Neal's paper will be published in full in our next issue).

Following the discussion of Dr. Neal's paper, a colored motion picture, "This Plastic Age," was shown. It was announced that the next regular meeting of the group will be held on April 30, with the place and program to be determined in the near future.

Rhode Island Meets March 26

The Spring Meeting of the Rhode Island Rubber Club will be held on Friday, March 26, at the Narragansett Hotel, Providence. Dinner will be served at 6:30 P.M. sharp. The program will include a speaker on elastic plastics.

Coming Events

March 16-17. N.A.W.M.D., Hotel Sherman, Chicago, Ill.

Mar. 19. New York Rubber Group, Building Trades Club, New York City.

Mar. 24-25. Ninth Annual Chemurgic Conference, Drake Hotel, Chicago, Ill.

Mar. 26. Rhode Island Rubber Club, Narragansett Hotel, Providence, R. I.

Apr. 6. Los Angeles Rubber Group, Mayfair Hotel, Los Angeles, Cal.

Apr. 7-10. Electrochemical Society, Hotel Roosevelt, Pittsburgh, Pa.

Apr. 9. Rubber & Plastics Div., Montreal Section, Society of Chemical Industry, McGill University, Montreal, Canada.

Apr. 15-16. Rubber Division, A.C.S., Book Cadillac Hotel, Detroit, Mich. (Technical sessions at Masonic Temple.)

Apr. 16. International Meeting, Buffalo Rubber Group and Ontario Rubber Section, Canadian Chemical Association, Detroit, Mich.

Apr. 30. Chicago Rubber Group, Hotel Morrison, Chicago, Ill.

June 28-July 2. Annual Meeting, A.S.T.M., Wm. Penn Hotel, Pittsburgh, Penna.

Oct. 5-7. National Safety Council, Sherman, LaSalle and Morrison Hotels, Chicago, Ill.

To Hold International Meeting

According to word from Burt W. Wetherbee, of the Globe Woven Belting Co., Buffalo, the annual International Meeting held jointly by the Buffalo Group, Rubber Division, A.C.S., and the Ontario Rubber Section of the Canadian Chemical Association will definitely be held in Detroit, Mich., on Friday noon, April 16. Luncheon will probably be held at the Book Cadillac Hotel. The importance of making advance reservations for the meeting is stressed and those planning to attend are urged to make reservations as early as possible with the secretary-treasurer of the Buffalo Group, Norman J. Cyphers, c/o Hewitt Rubber Corp., Buffalo, N. Y. The Rubber Division, A.C.S., meets in Detroit on April 15 and 16.

Composition of GR-I

The Office of the Rubber Director has announced that until manufacturers are advised to the contrary, all GR-I (butyl rubber) made at the Government plant in Baton Rouge, La., will contain 0.5% of phenyl-beta-naphthylamine as stabilizer. Butyl rubber samples supplied in the past have contained either sulfur or zinc oxide or both. For the present, all of the butyl produced will be of the so-called "white" variety; that is, it will not contain any carbon black.

LOS ANGELES RUBBER GROUP HEARS CROSBY AND COMSTOCK

J. W. Crosby, sales manager of the Thiokol Corporation, and Boyd Comstock, famous athletic coach, author and radio commentator, who had charge of athletics in Italy for seven years under the direction of the National Department of Foreign Affairs, were the principal speakers at the monthly supper meeting of the Los Angeles Group, Rubber Division, A.C.S., held at the Mayfair Hotel in Los Angeles on March 2. Approximately 105 members and guests were in attendance.

Mr. Crosby delivered a 45-minute talk on "Applications and Development of Thiokol Synthetic Rubbers," using numerous slides and illustrations. The special advantages of various types of Thiokol in specific applications were stressed by Mr. Crosby who later answered numerous questions from the floor.

Mr. Comstock's talk dealt with tendencies and conditions in Europe as he saw them at first hand. He said that the Italian people in general preferred an Allied victory since they see little but enslavement in the event of an Axis victory and that the poor showing of the Italian soldier was due almost entirely to a lack of enthusiasm for the Axis program. He accused the German government of poor sportsmanship where athletics were concerned, citing one instance where a German-Italian football game was cancelled when certain defeat faced the German team. Living conditions in Italy were extremely bad, the speaker stated, with under-nourishment quite general.

At the business session, the chairmen of various standing committees delivered their reports, that of the membership committee being especially encouraging. The treasurer's report indicated that a surprisingly large sum of money had been taken in and expended during the past year. Seven new members were voted in and initiation ceremonies, now a part of the monthly program, were performed.

A number of prizes were awarded. C. M. Reinke won $10 in war stamps, Bob Short $5, and Herman Jordan $3.75, all three gifts being donated by the Western Shade Cloth Co., through Ed Royal. A traveling case and a poker set, both donated by F. H. Banbury, went to J. W. Crosby and Jack Bain, respectively. Two billfolds were donated by H. Muehlstein & Co., through B. E. Biheller.

Fix Price on Thiokol Stock

Thiokol Corporation, Trenton, N. J., filed an amendment on March 2 to its registration statement establishing $5.00 a share as the price at which its present stockholders may purchase one or more of the 102,000 shares of common stock of $1.00-par value that it will shortly issue. Shares not taken by present stockholders will be offered later to the public.

SOVIET SYNTHETIC INDUSTRY SUBJECT OF SPECIAL REPORT

Russia may have a shortage of drugs and medical supplies, but her rubber industry expects to go right on working at top speed, unhampered by the loss of imported raw materials, according to officials of Russian War Relief, Inc., New York City, as reported in a recent issue of the *United Rubber Worker*, official organ of the United Rubber Workers of America. The facts on Russian rubber were obtained by the war relief organization in the course of its investigation of the Soviet Union's emergency supply needs.

Reason for the calmness with which the Russians can contemplate the situation, according to the report, is the fact that Russia has built her entire rubber industry on home-grown plants and the synthetic product. It is estimated that less than 10% of Russian rubber output depends on imported raw materials.

Another major reason for confidence is the fact that rubber production—quite a new branch of Russian industry—was organized with the danger of war in mind, and most of the big rubber factories were distributed far behind potential battle lines. Since they started from scratch, planned their industrial development, and were always acutely aware of war's menace, the Russians were able to build their tire factories in cities far inland, like Yaroslavl, Kazan, and the new industrial towns of the Urals. Most of the factories are of recent construction, for the Russian rubber industry has expanded rapidly.

Figures on Footwear Output

Indicative of the expansion are the figures on output of rubber footwear. In 1923, 28 million pairs were turned out; in 1927, 36 million pairs; in 1932, 65 million; in 1937, 84.6 million, and last year about 150 million were called for by the plan, though the figure may be affected sharply by the need for diversion of rubber to strictly military needs. Tire output last year was expected to run around 10 million.

This steep rise in output was paced by new factory construction and the development of native sources of raw material. Three great tire plants have been built since 1938, according to the Moscow newspaper "Industriya." All told, 14 new rubber factories were scheduled to be erected between 1937 and 1942. How many of these 14 were completed before the Nazi invasion cannot be verified, but it is indicated that all but two or three are in operation.

Meanwhile, intensive efforts were made to free the industry from dependence upon imported materials. Reclaimed rubber and synthetic rubber provided part of the solution to this question. About 15 per cent of the country's rubber output comes from reclaimed rubber. Fifteen reclaim factories have been erected near tire plants in recent years, and although several of these have not yet been placed in operation, it is expected that they will be rushed to completion to utilize war booty, which is being collected systematically at the fronts, with every destroyed truck stripped of its tires and parts.

Synthetic rubber production — which experienced a jump of 166 per cent in plant capacity during 1940, according to a Russian trade paper—has kept pace with the development of reclaimed rubber.

Leading in synthetic rubber planning has been a white-bearded, skull-capped 80-year-old Russian scientist, Academician A. Y. Favorsky. With his pupils, he has conducted most of the experimental work for the Russian synthetic product. In 1930 he scored his first success, when a bluish-white, translucent 144-lb. block of rubber was obtained synthetically at a Leningrad laboratory.

Today potatoes are the raw material of a large section of the Russian rubber industry. Alcohol is obtained from the potatoes, butadiene from the alcohol, and rubber from butadiene.

Within the past year the scientists have been working on production of isoprene rubber from coal, lime and water, paralleling current American research in this field. The coal and lime form calcium carbide, which, when acted on by water, forms acetylene, such as is used in welding. The acetylene is the base for isoprene rubber. Academician Favorsky's car rides on the first Russian isoprene tires, and commercial production is beginning.

A. Kochnev, chief of the laboratory of the great Yaroslavl tire factory, writes in the Moscow "Pravda" that a whole series of tires made at this plant is now 100 per cent synthetic rubber. The Yaroslavl 34x7 tires, which were 80 per cent synthetic in 1940, are now 100 per cent synthetic, and other sizes and kinds are being produced in growing number from the artificial product.

Decline of Business

War and its partners—shortage and uncertainty—are proving more powerful than active business as influences on the rate of business births, which are declining radically, with fewer new enterprises in almost every line, too few even to replace normal activity. These trends are revealed by the vital statistics of business recently compiled by Dun & Bradstreet from changes in the number of concerns listed in its reference books. In the rubber industry, for example, in the period from September, 1941, to September, 1942, four fewer names were added to the books, a decline of 15%, while in the same period eleven names were obliterated, an increase of 52%.

RUBBER SECTION OF A.S.M.E. SELECTS OFFICERS FOR 1943

The Rubber and Plastics Group of the American Society of Mechanical Engineers, organized last year to supplant the former Sub-Division of the Society's Process Industries Division, has announced its officers for 1943. These include Gordon M. Kline, of the National Bureau of Standards, Washington, D. C., as chairman; E. F. Riesing, of the Firestone Tire & Rubber Co., Detroit, vice-chairman; and Robert A. Boyer, of the Plastics Research Department, Ford Motor Co., Dearborn, Mich., secretary.

The new Executive Committee consists of the three above-named officers and L. E. Jermy (*Machine Design*), J. F. Downie Smith (United Shoe Machinery Corp.), E. G. Kimmich (Goodyear Tire & Rubber Co.), and F. L. Yerzley (Western Electric Co.).

The General Committee comprises the following: G. H. Kaemmerling (Lord Mfg. Co.), H. M. Richardson (General Electric Co.), D. H. Cornell (B. F. Goodrich Co.), A. L. Alves (Watertown Mfg. Co.), J. Delmonte (Plastics Industries Technical Institute), J. H. Teeple (Celanese Corp.), W. A. Zinzow (Bakelite Corp.), Joseph H. Dillon (Firestone Tire & Rubber Co.), J. C. Travilla, Jr. (General Steel Castings Corp.), M. E. Lerner (RUBBER AGE), R. A. North (Farrel-Birmingham Co.), F. L. Haushalter (B. F. Goodrich Co.), T. S. Carswell (Monsanto Chemical Co.), and R. G. Seaman (*India Rubber World*).

Chemical Engineers Hear Shore

T. Spencer Shore, vice-president and treasurer of the General Tire & Rubber Co., Akron, was the principal speaker at a meeting of the New York Section of the American Institute of Chemical Engineers, held at the Chemists Club in New York City on March 11. Mr. Shore, who recently resigned as chairman of the Business Advisory Committee of WPB after spending seventeen months in Washington, discussed "Industry, Peoples and Government." He stated that if the American way of life, which he called the free enterprise system, under which the United States with only 6% of the population of the world furnishes 47% of the world's production, was to survive industry would have to have a new awakening and embark on a "selling program" of its own. He stated that he had reached four definite conclusions as to the future: (1) Government will play an ever-increasing role in industry; (2) Industry must understand government and help to run it; (3) Human rights must be observed if property rights are to be maintained; and (4) the American people will have to fight on the home front to keep the American way of life. Harry E. Outcault, Technical Service Manager, Zinc Oxide Department, St. Joseph Lead Co., presided at the meeting.

FURNEX

BEADS or DENSE

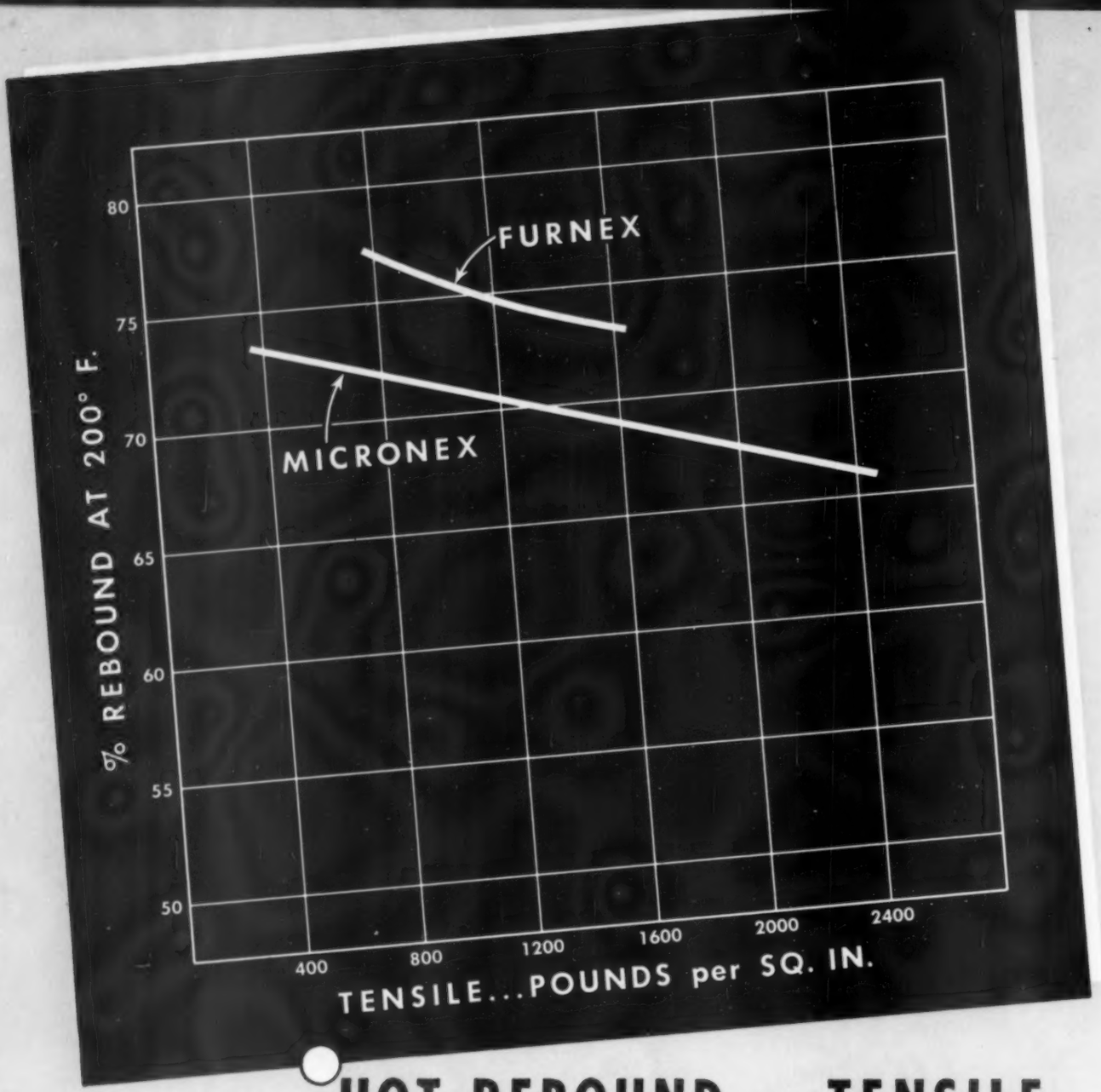
A COLUMBIAN COLLOID

for **HIGH RESILIENCE** *in*

GR-S

BINNEY & SMITH CO. · COLUMBIAN CARBON CO.

DISTRIBUTOR MANUFACTURER



HOT REBOUND vs. TENSILE IN *GR-S*

This chart gives evidence that, in general, high tensile strength is obtainable only at the cost of serious loss in rebound resilience.

Furnex Carbon stands out in giving much higher rebounds at intermediate tensile values.

This is of prime significance in compounding synthetic tires.

STATEX

The Black of Tomorrow, offers electrical conductance in combination with high pH, full reinforcement, low hysteresis.

MICRONEX

for 30 years the Standard Reinforcing Carbon...designed to impart maximum reinforcement to rubber.

COLUMBIAN COLLOIDS

BINNEY & SMITH CO. • COLUMBIAN CARBON CO.

DISTRIBUTOR MANUFACTURER

Cable Companies Are Fined

Fines totaling $77,500 were imposed on nine cable companies by Federal Judge Thomas F. Meany, of Newark, N. J., on February 15. The companies were charged with conspiracy to fix prices on Navy orders for $50,000,000 worth of cable. Maximum fines of $10,000 were imposed on the Okonite Co., Rockbestos Products Corp., Collyer Insulated Wire Co., General Cable Corp., National Electric Products Corp., and Anaconda Wire & Cable Co. A fine of $7,500 was imposed on the General Electric Co., while fines of $5,000 each were imposed on the American Steel & Wire Co. and the Phelps-Dodge Copper Products Corp. All nine companies pleaded *nolo contendere.*

In a statement to the court, Tom C. Clark, special assistant attorney general, said that "our investigation discloses that there is here involved neither dishonesty nor deception as generally understood by the public, nor such as would constitute deceit on the part of these defendants." Sealed indictments were returned against the companies in August, 1941, but were not made public until August, 1942. The type of cable on which the price-fixing charge was leveled uses no rubber in its construction.

Introduce Ambidex S

Ambidex S, a new activating plasticizer prepared especially for GR-S (Buna S) compounds, has been introduced by the Binney & Smith Co., New York. It represents a further development of the Ambidex recently introduced by the company and to avoid possible confusion the material originally introduced will be known as Ambidex Regular and the new grade as Ambidex S. The latter grade, according to Binney & Smith, will be of special assistance in the processing of GR-S stock, particularly from the plasticizing standpoint. It also assists incorporation and wetting of pigments. As in the case of Ambidex Regular in natural rubber, Ambidex S may be used in small percentages to allow reduction of fatty acid and accelerator percentages. However, higher percentages, from 5 to 10 parts, may be used where it is desired to combine the maximum plasticizing and tackifying effect and such higher proportions may be used without danger of over-curing.

Heads Akron Standard Mold Co.

Walter P. Voth, formerly vice-president of the Akron Standard Mold Co., Akron, Ohio, has been elected president and general manager of that company, succeeding the late A. J. Fleiter. Other new officers elected were Frank Behra, vice-president and factory manager, and J. I. Barnby, secretary and treasurer. It was also announced that Ward W. Sigler has been appointed sales and advertising manager; C. B. Hudson, chief engineer; and J. F. Fitzpatrick, production superintendent.

New Type Airplane Tire

Manufacture of a revolutionary type of airplane tire laced with steel coils to resist skidding on icy airport runways and in arctic and sub-arctic regions has been announced by the B. F. Goodrich Co., Akron. The tire has parallel rows of steel coils imbedded in the tread so that the edges grip on ice and snow. The rows of steel coils are bonded to the rubber around the circumference of the tire during vulcanization. This method of bonding called for a special method of tire construction.

A wall chart devoted to the recapping of tires with F grade capping stock has been prepared for general distribution by the Rubber Manufacturers Association, 444 Madison Ave., New York City. It is based on information taken from the R.M.A. Manual of Retreading and Recapping and is designed to aid retreaders in meeting the standards established by various governmental agencies.

A booklet reviewing the benefits of the abstract service on resins, rubbers and plastics offered by Interscience Publishers, Inc., 215 Fourth Ave., New York City, has been made available by that company. The abstract service, which is edited by H. Mark and E. S. Proskauer, is now in its second year.

The Shift-O-Graph, a perpetual work shift schedule, designed as an aid to companies now operating on a 24-hour basis and to encourage other companies to adopt plans for greater production, has been issued by the George S. May Co., 2600 North Shore Ave., Chicago. Copies are available without cost on application to the company.

A new type of nylon airplane tire, said to be 100% stronger than any previously known, has been announced by U. S. Rubber. These new nylon tires are actually more than twice as strong as any made from rayon or cotton fabric, according to the company's announcement.

Boston Hears Talk on Butyl

A talk on the "Compounding and Vulcanizing of Butyl Rubber," delivered by Garvin A. Taylor of Stanco Distributors, Inc., featured the meeting of the Boston Group, Rubber Division, A.C.S., held at the University Club in Boston on March 12. Approximately 200 members and guests were in attendance. Mr. Taylor discussed the characteristics and properties of Butyl, dwelling at some length on its electrical resistance. He revealed that the first Butyl plant was completed last January and is already in operation and that by the end of 1943 three planned plants should be in production with facilities of 68,000 tons per year. At the conclusion of his address, Mr. Taylor presented the sound film, "Bouncing Molecules." Bruce Thomas, noted war correspondent, also spoke at the meeting, giving an interesting account of his three trips with the Commandos on raids in Norway and France. At the business session, it was decided to hold an annual outing this year as usual.

Program Set for N. Y. Meeting

A symposium on the present situation in various divisions of the rubber industry, including latest developments in compounding and processing and with emphasis on major problems and how they are being met, will feature the meeting of the New York Group, Rubber Division, A.C.S., to be held on Friday, March 19, at the Building Trades Club in New York City. The following subjects will be included in the symposium: *Wire and Cable,* R. A. Schatzel (General Cable); *Footwear,* J. E. Robinson (U. S. Rubber); *Drug Sundries,* W. J. O'Brien (Seamless Rubber); *Proofed Goods,* R. R. Lewis (Vulcan Proofing); *Tires,* O. J. Lang (Armstrong Rubber); *Mechanical Goods,* Joseph Hayes (Rodic Rubber). As usual, the meeting will be held at 4:00 o'clock in the afternoon, with dinner served at 6:30 P. M. Paul S. White, director of public affairs and news broadcasts for the Columbia Broadcasting System, will talk after dinner on world conditions of today.

A new operating analysis chart for the scientific specification and accurate shop record of hydraulic and pneumatic "U" packings has been issued by Wayne Davies & Co., 325 West Huron St., Chicago. The chart, with complete conservation data, will be sent to packing users on request.

Surety Rubber Co., Carrollton, Ohio, has leased additional quarters in Carrollton and will move the entire shipping and inspection department to the new quarters as soon as repairs are completed. The space occupied in the main building by the shipping department will be equipped with new production equipment.

Who's Who in Washington—and Where

(As of March 5, 1943—Compiled by the Staff of RUBBER AGE)

OFFICE OF THE RUBBER DIRECTOR

Rubber Director—William Martin Jeffers.
  Special Assistants—Grafton B. Perkins and Darrell O. Churchill.
Deputy Rubber Director—Col. Bradley Dewey.
  Assistant—Morehead Patterson.
Assistant Deputy Rubber Directors—L. D. Tompkins (Operations), Frank R. Creedon (Plant Construction), E. B. Babcock (Technology and Specifications), R. P. Dinsmore (Research and Development of Synthetics), and E. R. Gilliland (Raw Materials).
Administrative Officer—Frank P. Downey, Jr.
Head, Education Program—Dr. H. E. Simmons, assisted by J. M. Ball (Editorial), E. B. Busenberg (Reclaim), D. F. Fraser (Neoprene), C. W. Sanderson (Thiokol), A. H. Nellen (Tires and Tubes), R. F. Wolf (Butyl), Arthur Nolan (Latex and Dispersions), and W. A. Appeltoft (Statistics).
Head, Product Specifications—C. S. Reynolds, assisted by V. R. Grainger, Walter Juve (Wire and Cable, etc.), R. C. Dabney (Tape, Proofed Fabrics, etc.), R. J. Hull (Tires and Tubes, etc.), S. C. Compher (Tire Retreading), and Addis Finney (Revision of Specifications).
Head, Natural Rubber—Atherton Lee.
Manager, Priorities and Materials Control—S. P. Dorsey.
Manager, Requirements and Capacities—Leland E. Spencer.
Manager, Allocation and Production—Karl D. Fernstrom.
Supervisor, Mechanical Goods—J. E. Skane.
Research Associates—Norman A. Shephard, M. Rea Paul, A. E. Boss, D. A. Cutler, J. E. Hutchman, C. W. Perry, J. C. Elgin, W. B. Wiegand, and R. W. Kixmiller.
Assistants to Rubber Director—P. J. Kelly and W. S. Maulsby.

Note: The Office of the Rubber Director maintains headquarters in the New Municipal Building, 4th and Indiana Streets, N. W., Washington, D. C. Telephone: Republic 7500.

RUBBER DEVELOPMENT CORPORATION

President—Douglas H. Allen.
  Assistants—R. B. Bogardus and James C. Roberts.
Vice-President—John W. Bicknell.
Head Field Technician—C. B. Manifold.
  Associates—Earl M. Blair and W. A. Stanton.
Rubber Analyst—Preston W. Barker.
Distribution Specialist—Richard Cooke.
Chief Procurement Analyst—A. J. Lockwood.
Rubber Specialist—L. B. Proctor.
Administrative Assistants—Curtis E. Anderson, Fred B. Black, John H. Brunner, B. B. Carlin, D. C. Carnes, Harry Carragher, H. J. Corson, Phillip Druiding, John D. Farnham, William V. Garrett, Everett G. Holt, Robert Hutchins, H. R. Merritt, E. G. Mills, E. B. Murphy, J. J. Pesaric, Harry Shere, G. W. Sniffin, Robert G. Walker, and R. S. Walter.
Senior Research Analyst—J. F. Dunbar, Jr.
Assistant Production Specialists—Richard S. Smith and G. R. Ward.

Note: The Rubber Development Corporation maintains headquarters in the Normandy Building, 1626 K St., N.W., Washington, D. C.

RUBBER RESERVE COMPANY

Chairman of the Board—Jesse H. Jones.
President—Howard J. Klossner.
  Special Assistant—China R. Clarke.
Vice-Presidents—R. D. Young, Henry A. Mulligan and Stanley T. Crossland.
Secretary—George H. Hubert.
Treasurer—W. C. Beck, Jr.
General Counsel—H. Clay Johnson.
Chairman, Buying Committee—A. L. Viles.
Vice-Chairman, Buying Committee—A. D. Moss.

Note: The Rubber Reserve Company maintains headquarters at 811 Vermont Ave., N. W., Washington, D. C. Additional personnel will be shown next month.

OFFICE OF PRICE ADMINISTRATION

Rubber Price Branch

Price Executive—Temporarily vacant.
Chief Counsel—John N. Cole.
Head, Raw Materials Section—Orson H. Hart.
Head, Tire Price Section—Robert V. Mitchell.
Head, Other Rubber Products Section—Everett D. Hawkins.
Head, Industry Analysis Section—George W. Bolton.
Head, Special Projects Section—Kenneth E. Lawton.
Administrative Officer—Arthur F. Schalk, Jr.

Automotive Supply Rationing Division

Director—Charles F. Phillips.
Legal Counsel—David L. Lloyd.
Head, Field Section—H. C. Butkiewicz.
Administrative Officer—C. A. Kellner.
Chief, Tire Rationing Branch—Robert S. Betten.
Heads, Tire Rationing Branch—R. G. Leeth (Eligibility Section), A. Koehler (Tire Industry Section), J. P. Collver (Research Section), and R. E. Sewell (Quota Section).

Note: The Office of Price Administration maintains headquarters in its own building at 3rd and Independence Sts., N.W., Washington, D. C.

GUAYULE EMERGENCY RUBBER PROJECT

Director—Evan W. Kelley.
  Associate—Paul H. Roberts.
  Assistant—E. L. Perry.
Chief, Division of Administration and Management—L. C. Stockdale.
Chief, Personnel Management—J. R. Nelson.
Chief, Division of Crop Production—L. S. Gross.
Chief, Division of Lands—G. F. Fine.
Chief, Surveys and Investigation—Dr. W. G. McGinnies.
Chief of Engineering—James J. Byrne.
Chemical Engineer—George W. Miller.
Head, Equipment Maintenance—George L. Bouck.
Principal Plant Physiologist—Dr. W. B. McCallum.
Head, Pilot Mill—D. S. Olson.
Head, Soil Surveys—John L. Retzer.
Director of Research—Dr. A. C. Hildreth.
Physiologist—Dr. Hamilton P. Traub.
Geneticist—Dr. Leroy Powers.
Pathologist—Dr. Wm. A. Campbell.
Agronomist—Delmar C. Pingey.
Rubber Technologist—Raiford L. Holmes.

Note: The Guayule Emergency Rubber Project, Forest Service, Department of Agriculture, maintains headquarters in Salinas, California. Most of the personnel listed above are members of the Forest Service, while others are officially members of the Bureau of Plant Industry.

VINYL COPOLYMERS IN ELECTRIC WIRE AND CABLE

The advantages of the vinyl copolymers over natural rubber in the insulating of electric wires and cables was the subject of a recent statement by the Bakelite Corporation, New York. These advantages were summarized as follows:

Vinyl resin insulating compounds for electric wires and cables offer many impressive advantages. They have very superior aging properties as compared to rubber; are far more resistant to oxidation in air or ozone; are not affected by moist, humid conditions; have better dielectric and other electrical properties; and—most important — have decidedly greater ability to retain their superior electrical characteristics. Moreover, unlike rubber, under service conditions, vinyl electric wire and cable insulations can be immersed in water for long periods without injury, and they are not damaged by contact with oils and greases. Also, they are highly resistant to many acids and alkalies, and to most solvents.

Particularly important is the "zero burning" characteristic of electric wire and cable insulations made from vinyl resins and plasticized compounds. Many serious fires have been spread by travel of flame along rubber-covered wire. With the new insulation, conflagrations propagated by this cause cannot occur.

An interesting and often extremely useful advantage of these electric wire and cable insulations is their availability in transparent, translucent, or opaque colors. When conductors are enclosed in transparent vinyl plastic sheathing, jacketing, or duct, they can be easily seen through the surrounding material, thus greatly aiding quick location of trouble.

Furthermore, with the vinyl plastic insulations ample dielectric strength and protection can be obtained for many purposes with thinner insulating walls. In other words, the outside diameters of the insulated wires can be smaller—require less space in ducts or conduits without sacrifice of current-carrying capacity. More wires, or wires of larger capacity, can be carried in ducts and conduits of a given size.

This is very important where rewiring must be done to increase capacity. In such instances it is often possible to get the needed capacity increase without tearing out old conduits and installing larger ones. Thus, use of the vinyl plastic insulated wire may save much expense, time, and annoyance, incidental to removing and replacing conduits in locations where to do so would necessitate damage and subsequent repairs to floors, walls or ceilings.

In this and other connections the toughness and resistance to abrasion, characteristic of insulating materials fabricated from vinyl resins and compounds, are important. Electric wire and cable insulations need to be strong and tough when conductors must be pulled into and fished through conduits and ducts.

Physical Properties of KemPol

Some data on the physical properties of KemPol, the new vegetable-oil rubber substitute developed by the Chicago plant of the Sherwin-Williams Co., the commercial manufacture of which was announced in our last issue, have been made available. Its tensile strength is 300 to 500 lbs./sq./in.; elongation, 100 to 150%; shore hardness, 40 to 70; elasticity, 50 to 25. After aging 72 hours at 170° F., its tensile strength increases about 100%; elongation decreases about 33%; hardness increases about 50%; and elasticity decreases about 10%.

William J. Walton, chemist in charge of KemPol production, examines a section of the new rubber substitute.

The chemical and solvent resistance of KemPol are, in general, similar to rubber. Specifically: Water—no effect; Alcohol—no swelling but impaired flexibility; Aliphatic hydrocarbons—50% swelling, tender; Aromatic hydrocarbons—200% swelling, very tender; Dilute mineral acids—very slight swelling; Concentrated mineral acids—poor resistance, especially with oxidizing acids; Dilute and concentrated alkalis—very poor resistance.

Pigmented with black, dielectric strengths of about 185 volts per mil have been obtained. Ozone resistance is reported as excellent, greatly superior to black rubber.

War Steptread Cement

War steptread cement, used to attach rubber to metal, has been developed by the Goodyear Tire & Rubber Co., Akron, to replace the regular steptread cement which contained materials no longer available for non-essential use. The new cement is made of non-strategic materials and is said to be a satisfactory substitute for the regular steptread cement. The new product, which may be used as a bicycle rim cement, is highly adhesive and resistant to weather exposure. It has been made available in quart bottles and gallon cans.

COMPLETE PRELIMINARY PROGRAM FOR 9TH CHEMURGIC CONFERENCE

Chemurgy in War will be the theme of the Ninth Annual Chemurgic Conference of Agriculture, Industry and Science, to be held at the Drake Hotel in Chicago, Illinois, on Wednesday and Thursday, March 24 and 25, according to the preliminary program of the meeting. Special sessions will be devoted to various chemurgic interests.

Rubber in War is the theme for the general session, which will be held on Wednesday afternoon, March 24, with Louis J. Taber, past master of the National Grange, presiding. Talks will be given at this session by the following: Andrew J. Snyder, Reichhold Chemicals, Inc.; Dr. Lewis Knudson, College of Agriculture, Cornell University; Dr. H. L. Trumbull, B. F. Goodrich Co.; Dr. M. C. Teague, U. S. Rubber Co.; and Dr. O. D. Cole, Firestone Tire & Rubber Co.

Alcohol at War is the topic of the evening session scheduled for the same day, with Howard Huston, assistant to the president of the American Cyanamid Co., presiding. Five papers are scheduled for this session, including talks by Charles L. Gabriel, president of the Publicker Commercial Alcohol Co., and Earl D. Unger of Joseph E. Seagram and Sons, Inc. The latter will discuss "New Processes in Alcohol Production."

On Thursday, March 25, sessions will be devoted to fibers, plastics, fats and oils, and forest products. Following a "Soybean Dinner" on Thursday evening, a concluding session will be held on New Crops for War and Peace. Six subjects will be covered at this session, including "Chemurgic Rubber Crops," by Dr. Paul J. Kolachov, technical counselor, Joseph E. Seagram and Sons, Inc.

Further details of the program or any of the specific sessions may be secured direct from the National Farm Chemurgic Council, Inc., sponsors of the chemurgic conferences, which maintains headquarters at 50 West Broad Tower, Columbus, Ohio, and an Eastern office at 551 Fifth Ave., New York City.

Reduce Price of Perbunan

Effective March 1, the price of Perbunan 26 was reduced from 70 cents to 63 cents per pound, F.O.B. Baton Rouge, Louisiana. Perbunan 26 is the regular oil resistant synthetic rubber sold by Stanco Distributors, Inc., of New York City.

A motor record card of convenient size (4 by 6 inches) for card files, which contains spaces on both sides for the recording of essential information on each motor as well as the nature and extent of inspections and repairs, has been made available by the General Electric Co., Schenectady, N. Y. In requesting the card by mail, ask for GES-1526A.

FINANCIAL NEWS

LOSS OF RUBBER PLANTATIONS CUTS U.S. RUBBER CO'S NET

The loss due to Japanese seizure of its rubber plantations caused a sharp reduction in the net earnings of the United States Rubber Co. in 1942, according to the annual report of that company. Net profit for the year amounted to $8,381,011, after all charges, including war losses of $15,487,414, which is equal to $1.82 each on 1,739,092 common shares, after allowing for preferred dividends, and which compares with $13,662,658, or $4.86 a share, in the preceding year.

Consolidated net sales in 1942 amounted to $290,992,037, a decline of 8% from the all-time high of $315,345,328 reported in 1941. The 1942 sales figure does not include compensation from operation of government-owned munitions plants on a cost plus fixed fee basis, this sum being included in other operating revenue of $3,022,230. Sales and earnings for the year were reduced by the amount of the repayment to be made to the Government as the result of renegotiation of war contracts, the amount of such repayment being included in the liabilities at the close of the year.

The company's investment in plantations, with the exception of a cash balance of $2,159,317 in London, as well as other foreign losses in export operations, were written off. Under the Revenue Act of 1942, these losses of $15,487,414 were taken as a deduction in computing Federal income taxes for the year.

With current assets totaling $138,670,730, and current liabilities down to $35,511,957, the company's working capital rose to $103,158,773, a gain of $14,808,854 over the preceding year. Foreign assets, after writing off plantations and other war losses, were $16,213,048, of which $12,491,617 is invested in Canada.

Net properties, plants and equipment were listed at $47,511,075, a decrease of $19,442,223 from last year, principally accounted for by the write-off of plantations. There was little change in inventories, the 1942 figure of $78,127,630 comparing closely with the 1941 figure of $76,665,649.

First Mortgage and Collateral Trust 3⅝ per cent Bonds, which constitute the only funded debt of the company, amounted to $34,563,000, on December 31, 1942, a reduction of $3,384,000 for the year. Sinking fund redemptions during 1943 will amount to approximately $2,838,000.

Both the number of employees and the amount of payroll reached new all-time highs during the year. At year-end there were 80,684 employees, including 28,881 in government war plants, but not including 20,000 employees normally engaged on the plantations. A total of $91,119,000 in wages and salaries was paid during 1942, excluding employees in war plants.

Although the current report is the fifty-first annual report of the company, the year 1943 marks 100 consecutive years for it in the rubber business. Two former subsidiary companies, L. Candee & Co. and the Goodyear Metallic Rubber Shoe Co., began operations in 1843. These companies were acquired when the company was organized and have been merged with it as part of the United States Rubber Co.

United Carbon Company

For 1942: Net profit of $1,780,520, after income and excess profits taxes, equal to $4.47 a share, which compares with $1,711,547, or $4.30 a share, in the preceding year. Net sales for 1942 amounted to $10,314,859, a drop of 9½% from those of 1941. A statement by Oscar Nelson, president of the company, accompanying the report, points out that the consumption of carbon black for tire manufacture was sharply curtailed by the restricted use of crude rubber and the inadequate supply of synthetic rubber and that the company barely broke even on its carbon black operations. Mr. Nelson also stated that the new plant at Ryus, Kansas, for the production of furnace-type black, started last year, will be in operation by mid-1943.

Raybestos-Manhattan, Inc.

For 1942: Preliminary report indicates net profit of $1,622,084, after reserves of $650,000 for post-war adjustments and contingencies and $6,675,000 for income and excess profits taxes, equal to $2.58 a share. This compares with $2,053,037, or $3.27 a share, in 1941, after reserves of $896,700 for contingencies and $4,500,000 for income and excess profits taxes.

Dewey & Almy Chemical Co.

For 1942: Net profit of $533,263, after provision of $428,000 for Federal, State and foreign taxes, which is equal to $1.81 each on 295,317 shares. This compares with $757,845, or $2.57 a share, reported for the previous year.

Philadelphia Insulated Wire Co.

For 1942: Net profit of $32,905, equal to $2.38 a share, which compares with $54,539, or $3.91 a share, reported for the preceding year.

EARNINGS OF $9,524,706 REPORTED BY B. F. GOODRICH

Consolidated net profit of the B. F. Goodrich Company for 1942 amounted to $9,524,706 after all charges, including Federal income and excess profits taxes of $30,266,000 (less debt retirement credit of $1,885,000 and post war credit of $1,026,000) and a reserve of $2,000,000 for all contingencies, equal to $5.72 per common share, which compares with $8,608,324, or $5.02 a common share, reported for 1941. In the latter year, $6,000,000 was set aside for contingencies.

Consolidated net sales for the year amounted to $238,784,372, as compared with $211,454,790 in the previous year, an increase of 12.9%. The value of production from Government-owned plants operated by the company is not included in the 1942 sales figures. Renegotiation of war contract prices was not completed by the year-end and the effect of such renegotiation is not reflected in the report.

The consolidated balance sheet as of December 31, 1942, shows total current assets of $109,447,543, including cash of $12,220,930, and current liabilities of $33,966,618, a ratio of 3.22 to 1. Net working capital at the year-end amounted to $75,480,925 against $69,378,012 at the close of 1941. Consolidated earned surplus at the year-end was $18,987,791, after payment during the year of dividends of $5.00 per share on 412,031 shares of preferred stock outstanding and $1.00 a share on 1,303,255 shares of common stock outstanding.

Inventories at the end of the year amounted to $57,469,308, an increase of $14,130,927 for the period. Net investments outside of the United States as of December 31, 1942, totaled $4,610,270, of which $2,787,159 applied to current assets and $1,823,111 to other assets. Of the total net investments, $3,777,977 applied to operations in Canada. All assets in enemy or enemy-occupied territories are carried in the company's accounts at no value. Retirement of funded debt, as provided for in the agreements pertaining to such debt, was augmented during the year by the prepayment of $4,000,000 of the 2¼% bank loan.

According to a statement accompanying the report, the plant of the Hycar Chemical Co., a Goodrich affiliate, produced more butadiene type synthetic rubber in 1942 than all other plants in the country.

Hewitt Rubber Corporation

For 1942: Net profit of $442,543, equal to $2.65 a share, which compares with $396,304, or $2.36 a share, in the preceding year. Net sales amounted to $12,082,934 against $9,202,067 in 1941. Although operating earnings of the corporation declined slightly during 1941, a smaller provision for post-war contingencies enabled it to show a greater profit.

GOODYEAR NETS $14,370,911 ON NEW RECORD SALES TOTAL

Based on consolidated net sales of $451,493,034, almost $200,000,000 in excess of the company's peak peace time year of 1929, when net sales totalled $256,227,067, and representing an increase of $120,893,360 over net sales for 1941, the Goodyear Tire & Rubber Co. reports a net profit of $14,370,911 for the year of 1942, after a charge-off of $8,000,000 for losses incurred through enemy seizure of company holdings in the Far East. This is an increase of $1,539,514 over the $12,831,397 reported for 1941 and is equivalent to $5.46 per common share.

In addition to the deduction of $8,000,000 for losses accrued in the Far East, the report also reflects a refund of $14,000,000 to the Government which resulted from the renegotiation of war contracts. This refund was deducted from sales and was included in the balance sheet under current liabilities. Provision for foreign income and excess profits taxes amounted to $21,957,794. Taxes within the United States amounted to $30,018,052.

The consolidated balance sheet, as of December 31, 1941, shows a total net foreign investment (not including that in enemy occupied countries) of $27,147,000, distributed as follows: Argentina, $3,755,000; Australia, $3,814,000; Brazil, $3,853,000; Canada, $7,066,000; Great Britain, $4,921,000; India, $477,000; South Africa, $762,000; Sweden, $1,199,000; Other Foreign, $1,300,000. Net profit of $5,216,475 from foreign subsidiaries and branches were incorporated in the report. The company's rubber plantations in Sumatra and in the Philippine Islands, the tire factory in Java, and investments in Singapore and other Far Eastern points, all of which are no longer under the company's control, were valued at $13,326,376, and this amount has been segregated on the current balance sheet. The amount was fully reserved for from contingency reserves provided in 1941 and 1942.

Working capital increased to $119,763,368 from a total of $106,076,807 a year ago, after retirement through the operation of purchase and sinking funds of $500,000 first mortgage and collateral trust 3½% bonds and 12,353 shares of $5 convertible preferred stock. In addition, the company retired the remaining $2,000,000 of 1½% serial notes and paid $500,000 into the Employees' Pension Fund.

To provide for increased working capital requirements necessitated by the rapid expansion of its business, Goodyear negotiated a five year $50,000,000 revolving credit with banks, without Government guarantee, of which $18,000,000 was outstanding at December 31, 1942. This revolving credit bears interest at 1¾% per annum, with a standby charge of ½ of 1% per annum for amounts not used.

In a letter accompanying the report, P. W. Litchfield, chairman of the board, revealed that Goodyear is building synthetic rubber plants for the Government at Akron, Houston, Texas, Baytown, Texas, and Los Angeles. With the cooperation of the Peruvian Government, a tire factory has been constructed at Lima, Peru, which is now ready to start operations. Mr. Litchfield also said that the company has been cooperating with the Department of Agriculture and the Rubber Reserve Co. in the production and gathering of crude rubber in Latin America.

OUR MEN NEED
★ BOOKS ★

SEND
ALL YOU CAN SPARE

Help a man in uniform enjoy his leisure hours. Give your good books to the 1943 VICTORY BOOK CAMPAIGN. Leave them at the nearest collection center or public library.

Dayton Rubber Mfg. Co.

Year Ended October 31: Net profit of $521,053, after reserves of $300,000 for contingencies and $1,010,227 for Federal income and excess profits taxes, equal to $2.42 a common share after preferred dividend requirements. This compares with $710,291, or $3.50 a share, after reserves of $175,000 for contingencies and $426,543 for taxes, reported for the previous fiscal year. Net sales in the year ended October 31, 1942, amounted to $14,063,151, highest in the company's history, and were 20% above the $11,748,727 reported for the previous year. Net working capital amounted to $3,781,593, a record year-end high, against $2,724,834 a year earlier.

St. Joseph Lead Co.

For 1942: Net income of $5,655,625, after provision of $5,499,605 for Federal income and excess profits taxes, equal to $2.98 a share on 1,955,680 shares outstanding, which compares with $4,893,455, after provision of $2,758,905 for taxes, or $2.50 a share, reported for 1941.

NET PROFIT OF $1,382,963 REPORTED BY GENERAL TIRE

General Tire & Rubber Company, Akron, reports a net profit of $1,382,963 for the year ended November 30, 1942, an increase of $164,000 over the $1,218,569 reported for the preceding fiscal year. The 1942 earnings were equal to $2.37 a share, against $2.05 in 1941. Current assets as of November 30, 1942, were listed at $14,979,110 and current liabilities at $4,935,302, a ratio of three to one.

In a statement accompanying the report, William O'Neil, president, said that expansion of the main plant at Akron, acquisition of additional barrage balloon plants, and leasing or purchasing of warehouse space was necessary to keep up with Government orders. At the Wabash, Indiana, plant, additional space was provided to take care of the manufacture of bomb casings and new rubber products necessary to the war effort.

Other activities of General Tire, Mr. O'Neil stated, included acquisition of a guayule extraction mill in Mexico and a contract to operate one of the Government copolymer plants in Texas. Agreements were entered into with the Carnegie Institute of Technology and Purdue University in connection with experimental work on synthetics and plastics.

Monsanto Chemical Co.

For 1942: Net earnings, after taxes and deduction of minority interest, of $5,515,836, equal to $3.75 a common share, which compares with $4.90 a share in the previous year. Although sales increased 8½% to $69,146,999, net income after taxes decreased 18%. Net income before income taxes was $16,588,738, an increase of $162,000 over 1941.

Reduce Price of Hycars

Hycar Chemical Co., Akron, Ohio, has announced that effective March 1 the prices of Hycar OR-15 and Hycar OS-10 will be as follows: 63c per pound for standard 100-lb. cartons; 75c per pound for quantities of 50 to 99 lbs. inclusive; 90c per pound in quantities of 1 to 49 lbs. inclusive. These prices are net, f.o.b., Akron.

Neoprene Prices Reduced

The Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, has announced that effective April 1 the price of Neoprene Type GN will be 45c per pound and that for Neoprene Latex Type 571 will be 25c per pound. These prices apply in all quantities and are f.o.b. Carney's Point, N. J.

LOS ANGELES NEWS

W. J. Voit, president of the W. J. Voit Rubber Corporation, is back in his office after having undergone a major operation. The company is erecting a large addition to its Los Angeles plant, the former quarters having become entirely too small for the growing business.

Louis Konig, formerly associated with Meldowney and Martin, rubber weighers and inspectors at Wilmington, has gone to South America in a governmental position in connection with the rubber industry.

A large number of the members of the Los Angeles Rubber Group have signified their intention of attending the national convention of the American Chemical Society in Detroit on April 15th and 16th.

Bill Haney, plant superintendent for the Kirkhill Rubber Company, who injured his foot two months ago, is still using crutches but expects to be able to throw them away before the next Rubber Group meeting.

Harry Prouse, of the Santa Fe Rubber Mills, is very proud of his son, who in recent months has been climbing very rapidly in the Diplomatic Corps.

George Farwell, secretary of the Northern California Rubber Group, was married about February 25th. Mr. Farwell is part owner of the Reliance Rubber Company in Oakland.

The Sierra Rubber Company, 2472 East Eighth Street, has completed a new stucco front on the building, a new paint job, and a thorough re-vamping of the offices.

The Standard Rubber Company, Inc., formerly known as the Los Angeles Standard Rubber Company, has its new building at Compton Boulevard and Gage Avenue practically completed. This will greatly enlarge the capacity of this company, the growth of which has been phenomenal during the last three years.

Lombard Smith, of the Lombard Smith Company, played host during the past month to Clay Noel, chief engineer of the Ideal Electric Manufacturing Company, of Mansfield, Ohio. He also entertained R. L. Stevens of the U. S. Hoffman Machinery Company, New York. Mr. Smith's company acts as the Pacific Coast representative of these two firms.

Ray Sexton, the genial catering expert whose duty has been to supervise the suppers for the Los Angeles Rubber Group for many years, is back on the job after a series of very sad occurrences. In addition to the loss of his mother and a surgical operation mentioned in the notes of last month his father has now been taken seriously ill and is confined to a hospital. In addition to that, Mr. Sexton's wife's father passed away during the last month.

Jim Wright of the United States Rubber Company reports that his wife has gone to Rochester, Minnesota, to undergo a major operation.

C. A. Carlton, of J. M. Huber, Inc., recently spent two weeks in Los Angeles where his company is represented by H. M. Royal, Inc.

Charles Lamb, Jr., who, with others, is organizing the Technical Rubber Company, reports that a location in Alhambra is under consideration. A factory building will be erected as soon as all details are completed.

Harvey Firestone, Jr., president of the Firestone Tire & Rubber Company, and J. Edward Trainer, vice-president, spent some time in the Los Angeles area during the past month. They contacted the various sales outlets in this area. Mr. Firestone was a guest at a banquet tendered in his honor.

F. H. Banbury, of the Farrel-Birmingham Company of Ansonia, Connecticut, is still in Los Angeles where he has spent several months. He is at the Ambassador Hotel.

E. H. Long, general manager of the Golden State Rubber Mills, Inc., reports that business is comparatively good and that his own health is continuing to improve.

The Printing Materials Division of the Bakelite Corporation, Unit of the Union Carbide and Carbon Corp., has moved its offices from 300 Madison Avenue to 285 Madison Avenue, New York City. The move was made to provide larger quarters for the sale and development of Bakelite plastic products for making matrices and printing plates.

The Goodyear FG-1, first Akron-built combat plane, made by the Goodyear Aircraft Corp., is now being flight tested. The FG-1 is a Navy fighter plane produced to the design of the famous Vought-Sikorsky Corsair, known as "the fastest fighter in the world."

COMMITTEE D-11 ON RUBBER ISSUES NEW SPECIFICATIONS

Emergency alternate provisions in two specifications covering Friction Tape for General Use for Electrical Purposes (D69-38) and Rubber Insulating Tape (D119-38) have been developed by Committee D-11 on Rubber Products of the American Society for Testing Materials to aid in procurement and in order to be in line with orders issued by WPB.

Emergency provisions in the specification for Insulated Wire and Cable (D469) are intended primarily to conserve rubber and provide an agreed-on specification for insulation which may be operated at copper temperatures above 60° C. The requirements are acceptable to a number of organizations whose inspection or activities involve a use of the material and since there has been no other standard available the new provisions will serve an important need and can be referred to in restrictive orders of WPB and can be made available to commercial organizations and Underwriters' Laboratories.

(EDITOR'S NOTE: All of the above emergency alternate provisions will be reproduced in our next issue).

Additional "E" Awards Made

Included among the companies awarded the Army-Navy "E" for production efficiency in recent weeks were the following:

Fidelity Machine Co., Philadelphia, Penna.

B. F. Goodrich Co., Louisville, Ky. (Koroseal plant).

B. F. Goodrich Co., Niagara Falls, N. Y. (Koroseal plant).

B. F. Goodrich Co., Texarkana, Texas (Ordnance plant).

Seamless Rubber Co., New Haven, Conn.

Sharples Chemicals, Inc., Wyandotte, Mich.

Simplex Wire & Cable Co., Cambridge, Mass.

Standard Oil Development Co., Esso Laboratories, Bayway, N. J.

Swan Rubber Co., Bucyrus, Ohio.

It was announced on February 17 that the award previously conferred upon the John A. Roebling's Sons Co., Trenton, N. J., was withdrawn due to "the excessive number of man-hours lost to production through work stoppages during the last four months of 1942."

Buys New Jersey Zinc Shares

The St. Joseph Lead Co. has purchased 195,000 shares of capital stock of the New Jersey Zinc Co. from the estate of the late Edgar Palmer, former chairman of the board of the latter company. The purchase is reported to represent less than a 10% interest in N. J. Zinc, which has 1,963,264 shares outstanding and was made for investment out of St. Joseph Lead's own cash resources. The total amount of the purchase was $11,651,250.

NAMES IN THE NEWS

ROBERT L. TAYLOR, until recently engaged in advertising and sales promotion work for the Monsanto Chemical Co., and one-time associate editor of *Chemical & Metallurgical Engineering*, has been named editor of *Chemical Industries*. He succeeds WALTER J. MURPHY, recently named editor of *Industrial & Engineering Chemistry*, replacing the late DR. H. E. HOWE.

G. K. HICKIN, formerly associated with Merck & Co., Inc., has been named head of chemical engineering design for the B. F. Goodrich Co., Akron.

C. E. HANNUM, previously manager of tire, battery and accessories sales for the Cities Service Oil Co., has been appointed assistant sales manager of the Pennsylvania Rubber Co., Jeannette, Penna.

P. V. MCKINNEY, formerly director of research for the Neville Co., Pittsburgh, Penna., has joined the Thiokol Corporation, Trenton, N. J., in a research capacity.

DAVID FEINBERG, head of the company of the same name in Medford, Mass., has been re-nominated as president of the National Association of Waste Material Dealers, Inc., which holds its annual meeting in Chicago on March 16 and 17. Nomination in this group is tantamount to election.

E. V. PETERS, vice-president of the St. Joseph Lead Co., and formerly associated with the N. J. Zinc Co., has been named consultant to the Protective Coatings Section, Paint and Varnish Unit, Chemicals Division, War Production Board.

HARRY E. BEANE, associated with the Bristol Co., Waterbury, Conn., since 1920, has been named sales manager of that company, with headquarters in Waterbury. Prior to joining Bristol he was associated with the Westinghouse Electric & Manufacturing Co.

GORDON YULE, one-time vice-president of the Falls Rubber Co., has been named assistant deputy director of the Cleveland, Ohio, office of the War Production Board. He has been serving with WPB's priorities division.

ROBERT C. DABNEY, JR., 18-year old son of ROBERT C. DABNEY, SR., former Goodrich chemist now serving with the Office of the Rubber Director in Washington, D. C., was accidentally shot to death in Akron on February 22 while playing "commando" with a group of companions. He was a freshman at the University of Akron.

CHARLES L. SHELDON, purchasing agent of the Hood Rubber Co., Watertown, Mass., who has been serving as director of the Containers Division of WPB, has resigned that post and has returned to Hood Rubber.

PAUL C. MATHEWSON, who joined the Pennsylvania Rubber Co., Jeannette, Penna., as factory superintendent several months ago, has been elected vice-president in charge of factory operations of that company.

MILLARD SWITZER, head of the Maple City Rubber Co., Norwalk, Ohio, suffered a fractured leg recently as the result of a fall from a horse. He is reported to be recuperating.

ARTHUR B. GUISE, formerly engaged in fire and safety engineering for the U. S. Rubber Co., has joined the duGas Engineering Corp. as vice-president in charge of development.

CYRIL R. PORTHOUSE, factory manager of the Pyramid Rubber Co., Ravenna, Ohio, has been appointed a member of the Medical and Surgical Rubber Goods Advisory Committee of the Office of the Rubber Director.

HARRY L. DERBY, president, American Cyanamid & Chemical Corp., has resigned as an industrial member of the National War Labor Board. The resignation was occasioned by the press of personal work.

E. E. ZEILSTRA, formerly with the Tire Division of the Ford Motor Co., has been named chief chemist of the insulated wire division of John A. Roebling's Sons Co., Trenton, N. J., replacing FRANK CLARK. The latter has joined the Lowell Insulated Wire Co., Lowell, Mass., as general superintendent.

R. H. SOTHERLAND, assistant purchasing agent of the Mansfield Tire & Rubber Co., Mansfield, Ohio, is now in Baton Rouge, La., where he is organizing a purchasing department for the Copolymer Company, recently organized to operate one of the Government synthetic rubber plants.

J. C. GIBSON, president of the Pioneer Rubber Co., Willard, Ohio, was confined to the Willard Municipal Hospital for several weeks recently, due to a stomach ailment. He is believed to be much improved at this writing.

EDWARD BARKETT, associated with the B. F. Goodrich Co. since 1926, and one-time office manager of the Oaks, Penna., plant, has been named staff superintendent of the tire division at Akron.

WILLIAM S. LONG, former Pacific Coast manager of the war products division of the U. S. Rubber Co., has been appointed operations manager of the company at Los Angeles. The job of operations manager is a new position prompted by the war production assignments made to the Los Angeles plant.

JOSEF D. ZELLER, a graduate in chemical engineering of the University of Alabama, who has been associated with the rubber industry for the past nine years, most recently with the development department of the U. S. Rubber Co. at Detroit, has joined the staff of Godfrey L. Cabot, Inc., Boston, Mass., in the capacity of a technical representative. He will assist FRED H. AMON.

F. K. TUTTLE, one-time buyer of advertising material for the Firestone Tire & Rubber Co., has joined the advertising department of the Seiberling Rubber Co., Akron, where he will be in charge of production and purchasing of advertising.

JAMES R. BROCH, formerly advertising manager of the Mohawk Rubber Co., Akron, has been named purchasing agent for that company, succeeding C. D. BUCHER. JOHN J. SINGLETON, associated with the company for 14 years, has been named sales manager.

FRANK J. SODAY, formerly assistant manager of the chemical laboratories of the United Gas Improvement Co., has been appointed technical director of the Copolymer Corp. plant at Baton Rouge, La.

WALTER H. NORTON, production manager of the four footwear division plants of the U. S. Rubber Co., has been appointed assistant general manager of the company's footwear division. He started with the company as a stock clerk 30 years ago.

LAWRENCE K. YOUSE, until recently with the Firestone Rubber & Latex Products Co., Fall River, Mass., has joined the Kleistone Rubber Co., Inc., Warren, R. I., as chief chemist.

Formaldehyde Under Allocation

Formaldehyde, and its chemical reaction products, hexamethylenetetramine and pentaerythritol, were placed under allocation on February 22 by WPB with the issuance of General Preference Order M-25 as Amended. The title of the order was amended to read Allocation Order M-25. The amended allocation order requires no authorization for acceptance or delivery of formaldehyde in any form or solution containing 555 pounds or less of formaldehyde by weight, 100 pounds or less of hexamethylenetetramine, or 350 pounds or less of pentaerythritol.

OBITUARIES

Walter C. Keys

Walter C. Keys, chief engineer of the new products department, Mechanical Goods Division, U. S. Rubber Co., Detroit, Mich., and one of the best known mechanical products engineers in the industry, died suddenly in Detroit on January 25 of a heart attack. At the time he was stricken he was working on engineering problems in connection with war equipment and only a short while before had received a letter of commendation for his work from the U. S. Navy.

Mr. Keys joined U. S. Rubber in 1927, following a decade spent in executive engineering posts with the Perfection Spring Co., the Standards Parts Co., the Eaton Axle Co., and the Gabriel Snubber Sales & Service Co. He had his early automotive experience with Buick, Cadillac, Chalmers, U. S. Motor Co., and the Church-Field Motor Co., after receiving his B.S.E.E. degree from the University of Michigan in 1907.

As a member of the Society of Automotive Engineers, Mr. Keys was active for 27 years in a wide range of technical and administrative committees, beginning with the last World War and ending with his untimely death. He was also a member of the A.S.M.E. and the author of numerous contributions to the technical literature. In recent years, his work was centered on methods of bonding rubber to metal. He leaves a widow.

Benjamin A. Keiley

Benjamin A. Keiley, president of the R. & J. Dick Co., Inc., manufacturers of balata, gutta-percha and canvas belting, of Passaic, N. J., died in his room at the Edgewater Beach Hotel in Chicago on February 17. His death was attributed to a heart ailment. He was attending a meeting of the Multiple V-Belt Drive Association, of which he was president. He was also chairman of the board of directors of the Power Transmission Council, Inc.

Mr. Keiley was born in Brooklyn, N. Y., in 1874 and resided in that city all of his life. He was the son of the late Major John D. Keiley, distinguished Catholic layman, who was a Knight of St. Gregory, and a nephew of Bishop Benjamin J. Keiley of Georgia. He joined the Dick organization as president in 1914 and was active in its management up to the time of his death. During the term of the late Mayor Gaynor of New York City, he served as Water Commissioner.

In addition to his work with the Dick organization, Mr. Keiley was also president of the Barry Pulley Co., Muscatine, Iowa. His clubs included the Montauk, Upper Montclair Country and the Crescent Athletic Club, the latter now defunct.

R. De W. Brixey

Richard De Wolfe Brixey, president and treasurer of the Kerite Insulated Wire & Cable Co., New York City and Seymour, Conn., with which he had been associated for more than forty years, died at his home, 420 Park Avenue, New York City, on March 14 at the age of 62. Mr. Brixey was born in Seymour and after being graduated from the Sheffield Scientific School of Yale University in 1902 returned to that town to begin his career with the Kerite company. Later, he came to New York City as general manager. Mr. Brixey was formerly president of the Art Centre in New York and until a few years ago was president of its later development, the National Alliance of Art and Industry. He was a member of the Sleepy Hollow Country, Pilgrim, Engineers, Bedford Golf and Tennis, and Yale Clubs.

Charles Williams Barber

Brig. General Charles Williams Barber, chairman of the board of the Thermoid Co., Trenton, N. J., died at his home in Short Hills, N. J., on January 7, at the age of 70. He had been retired from the U. S. Army since 1919. Born in Woodbury, N. J., General Barber studied law in the offices of H. S. Grey, one-time attorney general of New Jersey. He served in the Spanish-American War, saw service in the Philippines and on the Mexican border, and served overseas in the last world war. He was made a brigadier general in 1916. General Barber was an officer in the Legion of Honor and held the Distinguished Service Medal.

Mason Hulett

Mason Hulett, connected with the New York office of the Farrel-Birmingham Co., Inc., for the past nine years as sales engineer and consultant on gears, died suddenly on February 7 in Washington, D. C. He was 52 years of age. At the time of his death, he was on leave of absence from Farrel-Birmingham and was serving as Chief of the Industrial Gear and Speed Reducer Unit, Material Handling Equipment Branch, War Production Board. Mr. Hulett was born in Granville, N. Y., in 1891. He was a graduate of Rennsselaer Polytechnic Institute, Class of 1914, with a degree of civil engineer. He leaves one son.

News in Brief

Production of what is believed to be the largest pontons ever made for the American armed forces was recently started at the Goodrich plant in Akron, after the installation of a 25-ton vulcanizer. The increased load which engineers will be able to move over temporary bridges built over these pontons is a military secret. The vulcanizer making these pontons possible was designed by Goodrich engineers and made by the Miami Boiler Co.

A new type of asbestos fitting designed to take the place of critical metals in aircraft production has been announced by U. S. Rubber. Designed in any shape or form required, the new product is made to withstand continuous heat of 350° F. or a temperature as low as —40° F. The fittings are made from Asbeston, a woven form of asbestos fabric.

Bristol Co., Waterbury, Conn., has published a series of bulletins covering automatic control and recording instruments for industrial furnaces, dryers, kilns, and ovens. These have been bound together in loose-leaf form so that additions and revisions may be easily inserted. The binder set covers pyrometer recorders and controllers, thermometer recorders and controllers, humidity recorders, etc.

According to the National Board of Fire Underwriters, more than half of the 18,000 tons of crude rubber has been salvaged from the ruins of the disastrous fire at the plant of the Firestone Rubber & Latex Products Co. in Fall River, Mass., in October, 1941. The rubber was at first believed to be a total loss, but was recovered through entirely new methods of salvage.

A Climatic Research Laboratory for testing and evaluating the effectiveness of food, clothing and military equipment on human subjects under actual conditions of heat and cold has been established by the Army Quartermaster Corps at Lawrence, Mass. The cold chamber, around which the laboratory is built, has been reduced experimentally to a low point of —80° F. and will be able to obtain even lower temperatures if required.

Approximately 2,000,000 passenger cars and trucks disappeared from the streets and highways of the United States during 1942, according to reports made to and released by the National Automobile Dealers Association. The reports covered motor vehicle registrations at the end of 1942 in 36 states and the District of Columbia and comprise an estimated 80% of all the motor vehicle registrations in the country.

CANADIAN NEWS

P. Horace Boivan, president of the Granby Elastic Web Company, Ltd., was recently elected mayor of the city of Granby, Quebec, for the third time.

J. A. Martin, deputy rubber controller, has issued Order Number Rubber Seven which provides for the inclusion of Buna S and butyl synthetic rubbers in the term "rubber" for the purposes of rubber control.

These synthetics may now be imported only by the Fairmont Company, Ltd., the government-owned rubber stockpiling agency. Fairmont is the only agency which may deal in these synthetics before they are processed.

Goodyear Tire and Rubber Co. of Canada, Ltd., reports that reduced profits due to a small decrease in sales in 1942 were more than offset by reduced selling costs resulting from diminished civilian sales and increased war sales.

President A. G. Partridge states that although production of tires for civilian use has practically disappeared, the output of tires and tubes for trucks, busses and military transport continues to be a principal part of operations.

The company has established a reserve of $2,400,000 for adjustments which will arise in final settlement of government contracts.

The 1942 statement shows a profit, after taxes, of $2,594,332 compared with $2,221,211 for the previous year. After deducting depreciation this left a net profit of $1,918,557 as compared with $1,603,089 for 1941. The surplus for the year after payment of dividends was $342,511 compared with $22,881 which added to previous surplus amounts to $8,303,996 surplus carried forward. The statement lists working capital on December 31, 1942, at $10,293,859 compared with $9,016,911 at the end of 1941.

Due to lower provision for depreciation, net profits of Canada Wire and Cable for 1942 were slightly higher than for the previous year although gross income declined and taxes increased.

In his report to stockholders, president H. Horsfall states that in view of the number of orders in hand or in prospect it is expected that sales volume will be maintained at a high level during the present year. During the past year the company retired $356,600 of the preferred stock at a cost of $383,345.

Total earnings for 1942 were $3,562,210 compared with $3,740,579 for 1941. Depreciation of $294,801 for 1942 compares with $424,112 taken for the previous year. After depreciation and taxes, net profits for 1942 were $1,091,181 compared with $1,043,147. The refundable portion of the excess profits tax is included in this net profit figure. If this sum, amounting to $220,803, had been deducted from 1942 earnings the net profit would have been reduced to $870,378.

Surplus for 1942 was $484,577 compared with $437,468 which, added to previous surplus, amounts to $2,341,280 surplus carried forward. Working capital at the end of the year was $4,674,150 compared with $4,437,845 at the end of 1941.

Over 90 employees of the Dunlop Tire & Rubber Goods Co., Ltd., who had 25 years or more of service to their credit, assembled at dinner at the Royal York Hotel in Toronto on February 27 to organize themselves into an active club. J. I. Simpson, president and general manager, presented a number of engraved gold watches for long service. John Westren, formerly associated with the company, presented Tom Burns, oldest employee in point of service, with a bouquet of 46 roses in acknowledgement of 46 years with the company. Approximately 10% of the Dunlop employees have had over 25 years continuous service.

Canadian Resins and Chemicals, Ltd., has been organized by the Carbide & Carbon Chemicals Corp. and Shawinigan Chemicals, Ltd., to manufacture, supply and service Vinylite copolymer plastics in their granular resin form as well as in sheets, extrusion compounds, molding compounds, etc., at present being supplied by the Carbide & Carbon Chemicals Corp.

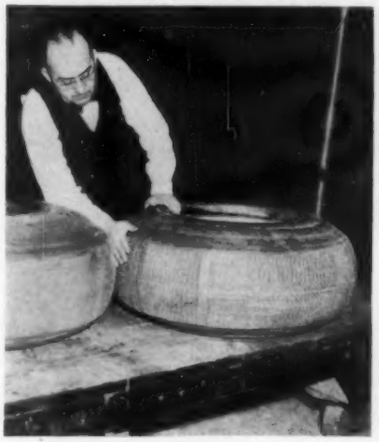
Chemigum is now being used in the production of printing press rolls, according to an announcement by Goodyear. Tests are said to have shown that Chemigum is far superior to natural rubber or other materials for this purpose.

The main building of the Paranite Wire & Cable Co., in Marion, Indiana, was damaged by fire on March 12. The building contained stores of crude and sheet rubber and unofficial estimates placed the loss at $100,000.

Carborundum Co., one of the largest manufacturers of abrasives, will construct an entirely new manufacturing building at its plant in Niagara Falls, N. Y. The new unit will be 63 by 313 feet in size, two stories in height, and will cost approximately $175,000.

Non-Skid Airplane Tire

A new type airplane tire whose tread comprises thousands of steel-wire spirals, designed to prevent skidding on snow and ice, has been introduced by the Goodyear Tire & Rubber Co., Akron. Embedded directly into the tread of each tire, the wire spirals supplement the tread's non-skid function. In the first step toward producing these tires, the wire coils are strung on steel rods to be transferred in parallel rows to rubber mats. The mats are linked together with cement into a strip long enough to cover the surface of a customary airplane tire carcass. Then the carcass is placed in a mold in the normal manner.



C. J. Burkley, who perfected the new Goodyear non-skid tread which uses small metal springs, examines a carcass in its unvulcanized state. A bomber tire of conventional construction is shown on the left.

Synthetic Rubber Compounding

Compounding of the various types of synthetic rubbers with carbon black is the subject of a series of nine laboratory reports recently issued by the Continental Carbon Co., 295 Madison Ave., New York City. Something of the scope of these research studies may be gleaned from the following list of titles: Compounding Buna S with Channel Carbon Black; Compounding Buna S with Channel Carbon Black, Report No. 2 (Comparison of Competitive Low Heat Generating Blacks); Continental Grades in All Reclaim Tread Stock; Competitive Soft Channel Blacks in All Reclaim Tread Stock; Effect of Various Mixing Procedures on Buna S Types Synthetic; Volume Cost Study; Carbon Black in Thiokol N, Continental Blacks in Thiokol N Recap Stocks; Carbon Black in Thiokol N, Standard Channel Blacks in Thiokol N Recap Stocks, Report TN No. 2, and Carbon Black in Neoprene Type GN, Continental Grades in Neoprene Type GN Tread.

40% LATEX
60% LATEX
REVERTEX

73-75% CONCENTRATED

RECLAIMED RUBBER DISPERSIONS

Compounds tailored to your special requirements

Technical Service is at your Disposal without charge or obligation

●

REVERTEX CORPORATION OF AMERICA

37-08 Northern Blvd., Long Island City, N. Y.

These WAR INDUSTRY Requirements are being Met by UNION BAY STATE ADHESIVES & COATINGS...

Seaming Inflatable Boats, Pontoons and Barrage Balloons—where either heater-curing or air-curing is desired.	√
Cementing double texture fabrics of the Vinyl lamination type.	√
Seam-sealing Jungle Tents & Hammocks—Shearling Coats—Paulin Seaming—Grommet Cementing—Tipping laces to fabric in Army Equipment.	√
Coating Submarine Woven Glass, Cable Tape, Foam Glass, Cloth and Decontamination Clothing where fire-retarding features, as well as resistance to mustard gas, oil and water are desired.	√
Coating ferrous and non-ferrous metals in the manufacture of magneto parts and similar electrical equipment for complete resistance to deteriorating effects of oil and ultra-violet ray.	√
Creating indestructible bonds between two totally different surfaces in the manufacture of Gaskets and Engine Mountings.	√
Cementing rubber mats to steel decks, weatherstripping, etc.	√
Coating tubing for life belts, flotation bladders, inflatable vests, foam glass, metal and wood for resistance to the elements.	√
Sealing imperfections on gas masks, tanks, etc.	√

Whether or not your particular adhesive or coating problem is listed here, we invite you to write us, stating your requirements.

UNION BAY STATE Company

50 HARVARD ST., CAMBRIDGE, MASS.

NEW EQUIPMENT

Porter-Cable Wet-Dry Belt Grinder

A wet-dry belt grinder, which can be successfully used with hard rubber products for removing flash, grinding flat surfaces, and the like, is manufactured under the name of the Porter-Cable Type G-8 Wet and Dry Belt Surfacer by the Porter-Cable Machine Co., Syracuse, N. Y. For wet operations, the machine is equipped with a controllable water system and double

spray nozzle. The drain has two 1¼-inch pipe holes with a pipe plug in the upper and a faucet in the lower to control drainage. A removable plate allows easy cleaning of the base. When the machine is equipped for dry work, the spray nozzle is omitted and instead of the drain plate a casting to accommodate a 6-inch exhaust air pipe is furnished. The base of the machine is cast iron, the bearings are sealed from dust and water, and the idler, or upper, pulley is mounted on a shaft supported on a dovetailed slide operated by a crank to adjust tension of the abrasive belt. A single knob is used for aligning the belt.

The Porter-Cable Wet-Dry Belt Surfacer is equipped with an oscillating feed table with micrometer stop. Heretofore belt machining has been limited to surfacing but one or two sides of a cube. With this table, however, it is possible to do all six sides and hold them to reasonable tolerance as to size, squareness and parallelism. The table is T-slotted and will accommodate a wide variety of stops, angle plates, jigs and fixtures for general production. In the tool room, the calibrated micrometer stop will triple the convenience of belt machining, according to the manufacturers, and the oscillating motion of the work will automatically maintain belt accuracy and the distribution of belt wear.

for Neoprene Compounding

Baker's

CALCINED MAGNESIA

1 **UNIFORM** wetting power and ease of dispersion

2 **UNIFORM** dispersion with improved stabilizing effect

3 **UNIFORM** quality maintained in moisture-proof packaging.

FREE TESTING SAMPLES UPON REQUEST

J. T. BAKER CHEMICAL CO.

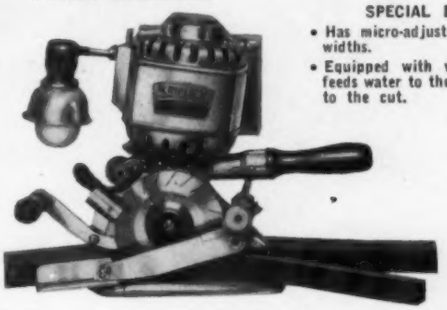
Phillipsburg, New Jersey

SIMPLEX
REG. TRADE MARK

RUBBER STRIP CUTTER

PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1" thick at the rate of 10,000 feet in 8 hours. Any width desired.



SPECIAL FEATURES

- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
- Has repulsion-induction motor which carries any overloads.
- Automatic sharpener device keeps knife keen and sharp.
- Has base with rollers and is very easy to handle.

Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Can be used to trim conveyor belts, cut sponge, pure gum, uncured stocks, etc. Cuts squarely—no rejects.

Now in use by many leading Rubber Manufacturers & Jobbers

Simplex Cloth Cutting Machine Co., Inc.

Manufacturers of a Complete Line of Cloth Cutting Machinery

270 West 39th St. New York, N. Y.

Cable Address—SIMPLEX, N. Y. *Phone*—WIsconsin 7-5547

LATEX

· NORMAL · CONCENTRATED · PROCESSED

Rubber Reserve permits promptly executed.
All types of latex compounded to meet customer's individual requirements.
Aqueous dispersions of reclaimed rubber.
Latex extenders.
Substitutes for latex and for latex adhesives.

Write us for further information, stating your specific problem.

Trade Mark

HEVEATEX

CORPORATION

78 GOODYEAR AVE. MELROSE, MASS.

Trade Mark

• NEW YORK, N. Y. • CHICAGO, ILL. • AKRON, OHIO •

CONTINENTAL MACHINERY CO.
305 BROADWAY - - NEW YORK, N. Y.

●

We are prepared to equip
Rubber Plantations with

Complete Plant Machinery
FOR
WASHING and DRYING CRUDE RUBBER

and can furnish engineers to install and place plants in operation.

Also Designers and Manufacturers of Complete Rubber and Latex Factory Equipment ● Plant Design, Layout and Operation by Skilled Engineers.

Cable Address
"Contimac" New York

COMCO

Telephone
WOrth 2-1650

Consider these Important
ORVUS ADVANTAGES

As a MOLD LUBRICANT

—Orvus permits articles to leave molds readily; molds clean easily.

—Orvus is effective in hardest water.

—Orvus forms no insoluble materials which might be deposited as a film on mold or rubber.

For WASHING and FINISHING

—Orvus cleans thoroughly such articles as inner tubes, automotive parts and other molded and extruded rubber goods. Leaves articles with a pleasing finish.

Write for further details about Orvus.

PROCTER & GAMBLE
CINCINNATI, OHIO

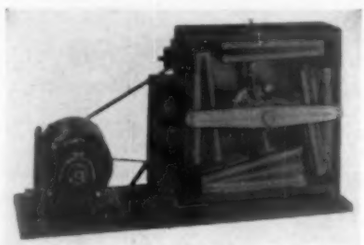
ORVUS*

*ORVUS is a sulfated alcohol type cleanser—not a soap.

The accompanying illustration is of the Type G-8 surfacer, showing a phantom view of the recirculating pump system the company is prepared to furnish with this type of machine. For grinding wet, it is necessary to have a recirculating pump system of this type or to connect the machine with the city water system. Company engineers recommend the pump system as the preferred set-up.

Positive-Type Vacuum Pump

A positive-type vacuum pump for production and laboratory applications has been announced by American Automatic Typewriter Co., 614 N. Carpenter St., Chicago. Available in two standard sizes, the pump is supplied with individual electric-motor drives, or without motors for use with an available power source. The pump employs four bellows mounted within a



square wood frame, connected to each other and to the pump outlet by a channel running through the frame. Bellows, which are successively expanded to exhaust air or gas from the equipment to which the pump is connected, are driven by a revolving shaft through connecting straps. The shaft is V-belt driven at a relatively slow speed, approximately 200 RPM, contributing to a smooth quiet running unit and low maintenance.

Flexible sides of the bellows are made of leather, as are intake and exhaust valves. All joints are gasketed by a sheet of neoprene cloth, and the frame or case has a black wrinkle finish. The larger of the two units is rated at 15 cu. ft. displacement at four inches of mercury. Bellows are six inches wide, and pumps individually driven use a ½-horsepower motor. The smaller unit, rated at 7 cu. ft. displacement at four inches of mercury, has 4-inch bellows and uses a 1/6-horsepower motor. The pumps are equipped with governors to vary their capacities, and to prevent excessive wear on pump parts, the power transmission unit or the motor when air or gas has been exhausted to the capacity of the pump.

The pump may be readily incorporated into the design of machines or equipment, providing advantages of quiet operation with low power requirements.

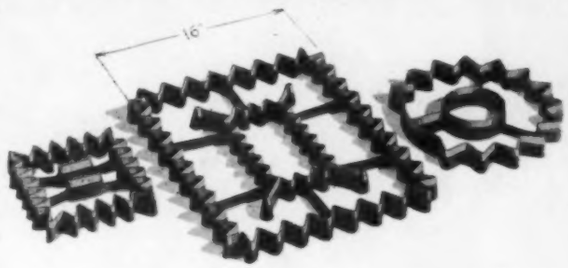
Small Brush Solves Major Problem

A wire brushing wheel, not much larger than a silver dollar, has relieved an important bottleneck in the construction of General Sherman tanks. These wheels, rotating on grinder heads, clean out the rubber that flows over into the end holes of tractor treads when the metal and rubber are vulcanized together. Before the brushing wheel was called into duty, the job of

D|C

SHARP EDGE CUTTING DIES

Also TOOLS, DIES, JIGS, FIXTURES
Machine Parts and Special Machinery



—38 Years in St. Louis—

Now Engaged In—

PRIME and SUBCONTRACT WORK
Defense and Civilian

★

INDEPENDENT DIE & SUPPLY CO.
LaSalle & Ohio Sts., St. Louis, Mo.

RANDALL & STICKNEY

Hand Grip Rubber Gauge No. 3-B

Height .....9"	Length .....9¾"	Range .....½"
Depth of Throat ....6½"	Dial 50 Divisions Each Div. 1/1000"	Weight .... 4 lbs. Frame . Aluminum

Designed for gauging stock as it is coming from the calender.

FRANK E. RANDALL, Waltham, Mass.

R-M-V

(RUBBER MAKERS VELVET)

Lamp Black

. . . is the ideal alternate for semi-reinforcing gas carbons . . . IN INSULATED WIRE, FOOTWEAR, AND EXTRUDED MECHANICALS

- Produces firm uncured stocks which process smoothly and do not sag.
- Cured articles exhibit high modulus in combination with good resilience.

Send for samples and compounding suggestions

LAMP BLACKS

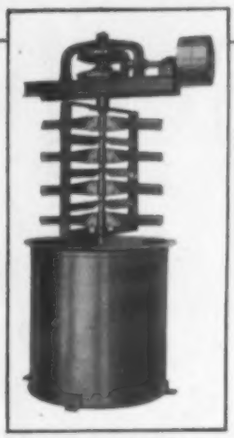
With a record of more than 90 years for excellence.

THE L. MARTIN COMPANY, INC.
UNIT OF COLUMBIAN CARBON COMPANY
Largest manufacturers of high grade lamp black in the world

BINNEY & SMITH CO.
DISTRIBUTOR OF RUBBER BLACKS
41 East 42nd Street, New York, N. Y.

GRINDERS • CRUSHERS • CUTTERS • SIFTERS

ROBINSON



UNIQUE

RUBBER PROCESSING EQUIPMENT

ROBINSON "Unique" Equipment for processing scrap vulcanized, hard and synthetic rubber or for the preparation of rubber cement is time-tested and performance-proven! Robinson engineers will make recommendations to meet your particular requirements. —*WRITE TODAY!*

LIQUID MIXER
(VERTICAL)
Various types of agitators and sizes to meet every mixing need.

ROBINSON MANUFACTURING COMPANY
30 CHURCH STREET, NEW YORK, N. Y.
Works: MUNCY, PA.

HAMMER MILLS • ATTRITION MILLS • MIXERS

Have You Arranged for Space In the 1943

Rubber Red Book?

★

Almost 100 leading suppliers have already ordered space in this edition — scheduled for publication in May.

For Rates and Full Details Write to

THE RUBBER AGE
250 West 57th St., N. Y. City

removing the rubber was a tedious hand operation. The strong adherence of the rubber increased the difficulty of the job.

The Osborn Manufacturing Company of Cleveland, solved the problem by devising a wire wheel with a diameter equal to the inside diameter of the pin hole. The wheel contains .014 steel wire, which is course enough to remove the rubber but not hard enough to mar the metal. One passage of the metal part over the revolving brush completes the job in a second or less. Although the brush was developed by the Osborn technical staff for this one application, it can be used similarly on other mechanical parts that will not be damaged by the wire. It will remove rust, weld scale, or burrs made by the boring of holes that intersect the hole being cleaned.

This Ringlock section brushing wheel, as it is called, is made by a comparatively new development in brushing wheel manufacture. The wire in the Ringlock section is locked in by a one-piece ring and sleeve. This reduces breakages and creates a dense brushing surface.

A new **Stabilized Tramrail Carrier,** that solves one of the oldest problems in hoisting, that of suspending a load rigidly with the use of the usual flexible hoisting ropes, has been announced by the Cleveland Crane & Engineering Co., Wickliffe, Ohio. By a simple patented arrangement of the ropes to form a triangular suspension, a load can be held rigidly in place so as to eliminate longitudinal, lateral and rotational sway.

A new **high-speed straightening press,** operated by a hand hydraulic pump, with a capacity up to 20,000 pounds, has been developed by the Anderson Bros. Mfg. Co., Rockford, Ill. The design of the press eliminates moving shaft from anvils to centers for checking. Checking and bending is done in the same position. When pressure is released, the spring tension on rolls brings the shaft free of the anvils and free to rotate for checking.

Abstracts of Papers

(Continued from page 502)

parative linseed oil preparation treated in the absence of polar compounds otherwise under equal reaction conditions.

In one series, 5 per cent sodium bisulfite was used as a polar compound together with 2 per cent of various organic auxiliary agents. In a second series, various inorganic salts were tested. In a third series, purely organic polar compounds have been investigated.

Results show that in loadings of 50 parts of treated oil to 100 parts of rubber, comparatively high tensile strength may be obtained, and that fatty oils treated with polar compounds seem to be greatly superior as rubber extenders, compared with untreated fatty oil preparations known in the art.

The following types of polar compounds seem to be most interesting: various alkali metal salts, cadmium sulfide, barium sulfide, ammonium iodide, and *m*-nitraniline hydrochloride, pinene hydrochloride, *m*-xylidine sulfonic acid, etc.

Aging experiments were also carried out, showing that even in the absence of antioxidants, polar compound-treated linseed oil preparations show good aging qualities in rubber mixes.

HITLER WANTS YOUR SCRAP TO REMAIN IDLE!

Hitler wants you to believe that scrap metal is no longer needed. He wants you to say — "I can't spare the time or men to clear this junk out." He wants to win the war!

And you're helping him to win it if you fail to round up your scrap and get it into the fight. You're dooming some brave American fighting men to die defenseless because a lack of scrap iron and steel deprived them of the weapons they need.

Don't rest on what you've done in the past. The experience of your fellow businessmen proves that you're *never* cleaned up in the first drive. There are thousands and thousands of tons of valuable scrap lying around in plants and shops of men who think they have already done the job.

Start now to carry on an organized scrap collection program. Apply the ruling given in the box to every idle piece of metal on the grounds. Form a Salvage Committee and select a high executive as Salvage Manager. Choose a man who has *authority*.

If some of the material you find is still usable, sell it as such to your scrap dealer, or a used machinery dealer; it will bring higher prices than the scrap. Write to this magazine for help with this problem, if necessary. Find a scrap dealer by looking in the classified telephone book — they are glad to get the kind of scrap you have to offer.

Above all . . . act now! The steel mills must have heavy scrap to mix with the light, household scrap collected last Fall. That is where the big shortage now lies. Do your part to keep our fighting men fighting . . . and winning!

WHAT IS DORMANT SCRAP?

Obsolete machinery, tools, equipment, dies, jigs, fixtures, etc., which are incapable of current or immediate future use in the war production effort because they are broken, worn out, irreparable, dismantled or in need of unavailable parts necessary to practical re-employment.

FOLLOW THIS RULE

If it hasn't been used for three months, and if someone can't prove that it's going to be used in the next three — sell it* — or scrap it!

*Scrap and used equipment dealers pay well for usable machinery and materials.

BUSINESS PRESS INDUSTRIAL SCRAP COMMITTEE

ROOM 3303, EMPIRE STATE BLDG., N. Y. C.

If you have done a successful salvage job at your plant, send details and pictures to this magazine.

SEND FOR PRIMER OF INDUSTRIAL SCRAP TO HELP YOU TACKLE THE SALVAGE PROBLEM

BUSINESS PRESS INDUSTRIAL SCRAP COMMITTEE
ROOM 3303, EMPIRE STATE BLDG., N. Y. C.

Please send a "Primer of Industrial Scrap" to

Your name_____

Company name_____

Company address_____

★ PLASTAC is an easy-to-handle liquid, non-fuming, non-retarding, and inexpensive.

Its plasticizing action makes it excellent for processing.

FOR SAMPLES, DATA, AND PRICES WRITE:

ADVANCE SOLVENTS & CHEMICAL CORPORATION
245 FIFTH AVENUE · NEW YORK, N. Y.

REVIEWS

BOOKS

The House of Goodyear (2nd Edition). By Hugh Allen. Published by Goodyear Tire & Rubber Co., Akron, Ohio. 6 by 9 in. 417 pp. $2.00.

Although like the first edition, this book is the story of the birth and growth of the tremendous Goodyear organization, it is also the story, very well told, of rubber which, as the genial Mr. Allen puts it, has been "taken from the laboratory (by the fall of Malaya and the Netherlands Indies) and put on the front page of the nation's newspapers." As Mr. Allen so ably says, rubber is no longer an academic question. Therefore, although the book is written primarily for the internal industry audience, it contains phases of much wider interest.

The current edition brings up-to-date the ever-fascinating tale of rubber from its earliest history to its growth as a billion dollar industry transferred bodily from one hemisphere to another and now starting back, from the smuggling of seeds out of Brazil by Wickham in 1876 by tramp steamer to the delivery of seedlings by Clipper planes in 1941. The many international struggles for the control of rubber are exceptionally well handled and clearly portrayed for the non-initiate.

The effect of rubber on such diverse personalities as William Jennings Bryan, William Howard Taft and Winston Churchill is discussed factually. An authoritative section on synthetic rubber, indicative of the "damn the torpedo" attitude of American industry, is included. The prominent part played by various Goodyear technicians in the development of the growing synthetic rubber industry is interwoven in the telling.

The book is divided into eight chapters, as follows: (1) Economic Heresies and Modern Business; (2) A History of the Company; (3) Materials: Rubber and Cotton; (4) Products: Tires; (5) Expansion: In United States; (6) Industrial Relations; (7) Distribution; (8) Defense Demands on Industry. Each chapter is split into numerous sections for the convenience of the reader. In addition, a Chronology of Rubber, from 1498 to 1942, a list of National Balloon Race Winners, a list of International Races, and a complete subject index are included.

•

Adhesives. By Felix Braude. Published by the Chemical Publishing Co., Inc., 234 King St., Brooklyn, N. Y. 5¼ x 8½ in. 154 pp. $3.00.

Written primarily for the practical man who is interested in adhesives either as producer, consumer or salesman, this book is not intended for the specialist or those concerned with the scientific aspects of adhesives. The subject is presented from the practical point of view with a minimum of theoretical discussion and, following the author's purpose, in non-technical language. Before considering specific types of adhesives, the author first discusses the theory and application, tests and raw materials. A chapter is also devoted to equipment. The book has 19 chapters in all, including one devoted to rubber adhesives and another to rubber dispersions and solutions as adhesives. A carefully cross-referenced index is included.

•

Simplified Guide to the Selection and Application of Commonly Used Motor Controls. (GEA-4015). General Electric Co., Schenectady, N. Y. 8 x 10½ in. 16 pp.

How to select and apply motor control is explained in this new, easy-to-read manual. The fundamentals of control are presented in an interesting and understandable manner with many illustrations and explanatory diagrams for visual aids. A progressive breakdown of standard controls available, describing their operation and function, is included, as is a description of enclosures for industrial control devices.

WAX FINISHES FOR RUBBER GOODS!

Easy to apply, water-repellent, non-flammable, Johnson's Wax Finishes are valuable allies for the manufacturer of rubber goods. They retard oxidation, the destroyer of rubber, and add a lustre which improves the appearance of the finished products.

Application may be made by dipping, spraying or wiping. Johnson's Wax Finishes cover 2,000 feet or more per gallon. Available in 5 and 55 gallon drums.

For samples and further information write

S. C. Johnson & Son, Inc.
Industrial Wax Division—Dept. RA 33
RACINE, WISCONSIN

Buy United States War Bonds and Stamps

Helping to solve war problems

War has created shortages of many materials and the war program demands their replacement or entirely new compounds and formulae. Chemical progress has helped to solve some of these problems. Today, thanks to Neville's constant research and highly specialized experience, distinctive advances are being made in the field of coal-tar chemicals, synthetic resins and plasticizing oils.

Investigate Neville Chemicals for your war work A-7

THE NEVILLE COMPANY
PITTSBURGH · PA.
Chemicals for the Nation's War Program

BENZOL • P.-TOLUOL • XYLOL • TOLLAC • NEVSOL • CRUDE COAL-TAR SOLVENTS
HI-FLASH SOLVENTS • COUMARONE-INDENE RESINS • TERPENE RESINS • TAR PAINTS
RUBBER COMPOUNDING MATERIALS • WIRE ENAMEL THINNERS • DIBUTYL PHTHALATE
RECLAIMING, PLASTICIZING, NEUTRAL CREOSOTE, AND SHINGLE STAIN OILS

Improve the tack **WITH**

CRYSTEX insoluble SULPHUR

Crystex, an amorphous sulphur, improves the tack by preventing bin-cure and dryness which usually occur when a high percentage reclaim compound is used.

Crystex prevents bloom in uncured rubber stocks. It does not dissolve in rubber but will "stay put" at temperatures usually prevailing during storage periods. Crystex is of outstanding value when employed in the manufacture of stocks to be used for repair materials, in retread stocks, valve-patch frictions, and other products.

The characteristics of Crystex indicate that further uses may be found for this product in the rubber making industry.

OTHER RUBBERMAKERS' CHEMICALS

Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure
Refined Rubbermakers' Sulphur, Tube Brand, 100% Pure
Carbon Tetrachloride, Carbon Bisulphide
Caustic Soda, Sulphur Chloride

Stauffer CHEMICALS SINCE 1885

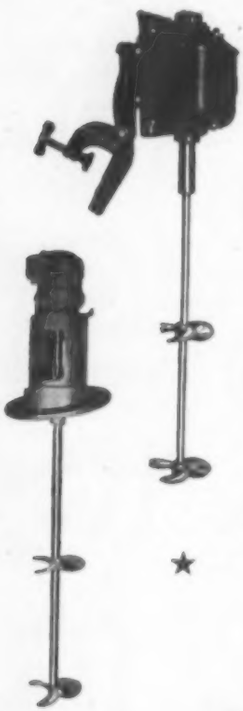
STAUFFER CHEMICAL CO.

420 LEXINGTON AVE., NEW YORK, N. Y.
230 NO. MICH. AVE., CHICAGO, ILL.
624 CALIFORNIA ST., SAN FRANCISCO, CAL.
555 SO. FLOWER ST., LOS ANGELES, CAL.
424 OHIO BUILDING, AKRON, OHIO
NORTH PORTLAND, OREGON
HOUSTON, TEXAS, APOPKA, FLORIDA

EASTERN MIXERS

FIT THE JOB AND STAND UP TO IT

Eastern mixing equipment is known all over the world for the sturdy dependability which wartime manufacturers in critical industries must have. Equally important is the proper fitting of the right equipment to the job. Eastern's line is complete. Eastern's engineers are mixing specialists. We invite the inquiry of manufacturers who have a problem of proper agitation, such as:

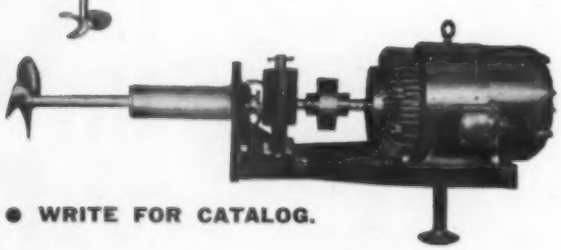


★ ***Manufacturers making products from natural or synthetic latex.***

★ ***Manufacturers making products from water dispersions of natural, synthetic rubber and reclaimed rubber.***

★ ***Manufacturers of artificial latices or water dispersions.***

★ ***Manufacturers using flammable materials in the production of rubber products and rubber cement.***



● **WRITE FOR CATALOG.**

EASTERN ENGINEERING COMPANY

68 FOX STREET ● NEW HAVEN, CONN.

Fundamentals of Machines. By Glenn M. Hobbs, L. H. Morrison, and Ray F. Kuns. 294 pp. 227 ill. $2.00.

Fundamentals of Electricity. By Wynne L. McDougal, Richard R. Ranson, and Carl H. Dunlap. 388 pp. 310 ill. $2.00.

Fundamental Shop Training. By John T. Shuman, Capt. Bailey Wright, and James Ritchey. 350 pp. 288 ill. $2.00.

Published by the American Technical Society, Drexel Avenue and 58th Street, Chicago, Illinois.

These three books, prepared by the publisher at the request of the United States Office of Education and the War Department, are intended for use by the pre-induction classes now starting in high schools throughout the country. Students preparing for war service will attend these classes. The importance of the work may best be appreciated by the fact that out of every hundred men inducted into the service, sixty-three are assigned to duties requiring specialized training. The courses are designed to acquaint future inductees with the tools, the processes and the principles of operation of the equipment they eventually must use.

The title of each of the three books is indicative of the contents. The text in each case follows outlines recommended by the War Department and includes information necessary to operational skills. The books were prepared by outstanding experts in the fields of machinery, electricity and shop practice, respectively, ably assisted in each case by a staff of expert technicians. Workbooks are furnished with each text at an additional cost of 50 cents each.

The texts of all three books are fully up-to-date, clearly written for the student, and well illustrated. Emphasis in many instances is placed on the illustrative matter, particularly in the book devoted to the fundamentals of electricity. Subject indexes are included in each of the books. Although designed for use in school classrooms, the books are also adaptable by individuals for home study work. They may also be of valuable aid to large industrial concerns conducting their own training courses on any of the subjects covered.

●

National Fire Codes for Extinguishing and Alarm Equipment: 1943. Compiled by Robert S. Moulton. Published by National Fire Protection Association, 60 Batterymarch St., Boston, Mass. 6 by 9 in. 672 pp. $3.00.

This volume brings together for convenient reference the many standards dealing with the various types of fire extinguishing and alarm equipment and related features of supervision, maintenance and organization. It is divided into seven sections, ranging from automatic sprinklers and water supply to employee organization. Numerous drawings are used throughout the text. Plant engineers, managers, operators, safety directors, fire marshals, and building and insurance inspectors will find the book of immense value.

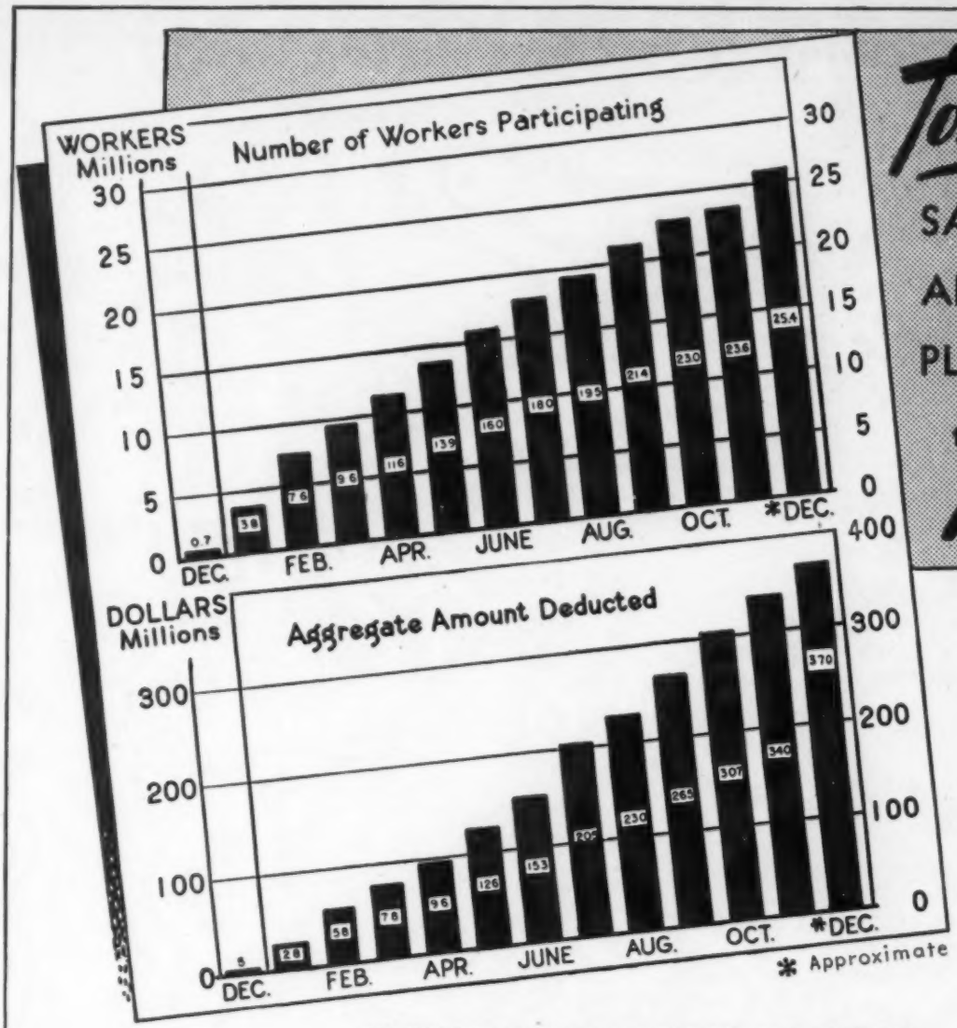
●

National Fire Codes for the Prevention of Dust Explosions: 1943. Published by the National Fire Protection Association, 60 Batterymarch St., Boston, Mass. 6 by 9 in. 160 pp. $1.00.

The fifteen American standard codes for the prevention of dust explosions are contained in this specially-compiled book, as well as a statement of the fundamental principles of dust explosion prevention in industrial plants and a record of some 780 dust explosions which have occurred in the United States. A standard method of using carbon dioxide or other inert gas for the prevention of explosions and fires is also included. The codes, which are purely advisory as far as the N.F.P.A. is concerned, are a revision in certain details of the 1940 edition.

●

A method originated for measuring laboratory temperatures at highest known precision, widely used by operators of air conditioning systems, chemical processes, oil refineries, etc., is described in *Micromax Resistance Thermometers* (Catalog N-33C) recently issued by Leeds & Northrup Co., 4907 Stenton Ave., Philadelphia.



Tomorrow's SALES CURVES ARE BEING PLOTTED . . . Today

THESE CHARTS SHOW ESTIMATED PARTICIPATION IN PAYROLL SAVINGS PLANS FOR WAR SAVINGS BONDS *(Members of Armed Forces Included Starting August 1942)*

STUDY THEM WITH AN EYE TO THE FUTURE!

There is more to these charts than meets the eye. Not seen, but clearly projected into the future, is the sales curve of tomorrow. Here is the thrilling story of over 25,000,000 American workers who are today voluntarily saving close to FOUR AND A HALF BILLION DOLLARS per year in War Bonds through the Payroll Savings Plan.

Think what this money will buy in the way of guns and tanks and planes for Victory today—*and mountains of brand new consumer goods tomorrow.* Remember, too, that War Bond money grows in value every year it is saved, until at maturity it returns $4 for every $3 invested!

Here indeed is a solid foundation for the peace-time business that will follow victory. At the same time, it is a real tribute to the voluntary American way of meeting emergencies that has seen us through every crisis in our history.

But there is still more to be done. As our armed forces continue to press the attack in all quarters of the globe, as war costs mount, so must the record of our savings keep pace.

Clearly, on charts like these, tomorrow's Victory —*and tomorrow's sales curves*—are being plotted today by 50,000,000 Americans who now hold WAR BONDS.

EVERYBODY EVERY PAYDAY AT LEAST 10%

Save with

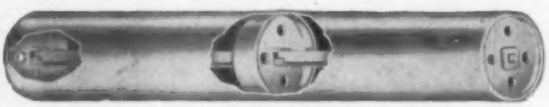
War Savings Bonds

This space is a contribution to America's all-out war effort by

RUBBER AGE

COLORS for RUBBER
Red Iron Oxides
Green Chromium Oxides
Green Chromium Hydroxides
•
Reinforcing Fillers and Inerts
C. K. WILLIAMS & CO.
EASTON, PA.

RUBBER AGE
One of the World's Outstanding Rubber Journals
•
Keeps the rubber industry posted on all current technical, news, market and statistical developments.
The indispensable rubber journal read by the industry's leading executives, engineers, chemists, buyers, salesmen, etc.
Annual subscription in U. S. — $3.00
RUBBER AGE
250 West 57th Street New York, N. Y.

New and Better
GAMMETER'S
ALL STEEL ALL WELDED
CALENDER STOCK SHELL

4" - 5" - 6" - 8" - 10" - 12" diameters, any length.
Besides our well known Standard and Heavy Duty Constructions, we can supply light weight drums made up to suit your need.
THE W. F. GAMMETER COMPANY
CADIZ, OHIO

SOFTENERS and PLASTICIZERS
For RUBBER
From the Pine Tree
ROSIN OIL
PINE TAR
BURGUNDY PITCH
GALEX a non-oxidizing RESIN
Send for "Pine Tree Products" *Booklet*
NATIONAL ROSIN OIL & SIZE CO.
R. K. O. BUILDING, RADIO CITY, NEW YORK, N. Y.
Plant: Savannah, Ga. Branches in Principal Cities
PIONEERS OF THE INDUSTRY

BOOKLETS, CATALOGS, Etc.

DuPont Rubber Chemicals. (Report No. 43-1). Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware. 6¼ by 9¼ in. 144 pp.

The last edition of the report containing complete descriptions of all DuPont rubber chemicals, neoprene and neoprene latices was published in 1937. Its revision has been complicated by the rapidly dwindling supply of natural rubber and the growing availability of the newer synthetic rubbers. Because of the urgency of the situation, revisions of some parts of the original report have already been issued by DuPont in the form of individual technical reports. The titles of these special reports included: The Neoprenes, The Compounding of Buna S, and Rubber Latex Compounding. The present publication is a revision of another portion of the 1937 report. It is divided into three parts, the first devoted to brief descriptions of all DuPont rubber chemicals, the second containing descriptions of DuPont rubber colors, and the third showing the solubilities of many of the chemicals in rubber, neoprene and some common solvents. The compounding characteristics of the chemicals refer, in most cases, to behavior, in rubber. Where the information is available, however, the amounts that should be used and the principal effects of the company's chemicals in neoprene and in Buna S stocks are given.

•

The Carbon Reinforcement of Buna S (GR-S). Columbian Carbon Co. (Binney & Smith Co., Distributors), 41 East 42nd St., New York, N. Y. 5½ by 7¾ in. 152 pp.

This booklet, issued as Volume IV in the series published under the title of "Columbian Colloidal Carbons," examines the carbon reinforcement of Buna S (GR-S) from a dual approach. First, the properties are related to the surface area of the respective carbons as determined by the electron microscope and, secondly, by cross-graphing. In the first approach, the study revealed that Buna S is entirely dependent on colloidal carbon for strength, tensile being improved 600%. The evidence also indicates that carbon reinforcement is itself a component in Buna S vulcanization and in this connection a new method is offered for recognizing carbon "starvation" in Buna S. The cross-graphing approach serves to bring out the important differences in rate of change of properties with carbon surface and loading as between different carbons. The study, in this connection, proves that tensiles are affected chiefly by surface area, hardness by loading, rebound by both surface area and loading, while carbon network structure makes its own distinctive contribution. The booklet also describes two new physical tests, termed "Shore Creep" and "Flex Crack Growth," respectively. The first is a new application of a universally known test, while the second embraces the use of a new measuring machine.

•

Service Notes on Buna-Carbon Compounding. Binney & Smith Co., 41 East 42nd St., New York, N. Y. 8½ by 11 in. 7 pp.

An outline of carbons available for the compounding of GR-S (Buna S), including a brief description of practical considerations in connection with the processing and compounding of carbon reinforced Buna S stocks, is presented in this technical bulletin. Data is given covering the combustion furnace, full reinforcing, and channel impingement blacks, with suggestions for nomenclature included. Data is also given to prove that whereas with natural rubber addition of pigment progressively reduces elongation, carbon is necessary in the case of Buna S to develop elongation.

•

How to save months of time and tons of vital materials in getting reliable power to new production machinery is told by the General Electric Co., Schenectady, N. Y., in *Quickly-Installed Electro Power Systems for New Plants and Plant Extensions*, a new informative booklet recently distributed.

USMC Lining Trimming Machine
Model B

USMC Lining Trimming Machine

Model B

THE USMC Lining Trimming Machine—Model B, is especially designed for trimming the surplus lining of Rubber Boots, Pacs, Lumbermen's Boots and Gaiters.

This machine not only insures uniform trimming, but does the work more economically than any other method.

It has an individual motor drive and is portably mounted allowing the work to be handled efficiently.

A number of these machines are being used in various Rubber Footwear Factories with excellent results.

Machines are sold outright.

Write to the nearest branch for prices and further particulars.

United Shoe Machinery Corporation

BOSTON, MASSACHUSETTS

Auburn, Maine.....38 Minot Ave.
Brockton, Mass.....93 Centre
Chicago, Ill.....500 South Franklin
Cincinnati, Ohio.....407 East Eighth
Harrisburg, Pa.....20 So. Fourth
Haverhill, Mass.....145 Essex
Johnson City, N. Y.....19 Jennison Ave.
Lynn, Mass.....525 Union
Milwaukee, Wis.....922 North Fourth
Nashville, Tenn.....901 Church St.
New York, N. Y.....110 Fifth Avenue
Philadelphia, Pa.....221 North 13th
Rochester, N. Y.....60 Commercial St.
St. Louis, Mo.....2200 Washington Ave.
San Francisco, Calif.....859 Mission
Worcester, Mass.....71 Mechanic

Three types of CALCINED MAGNESIA for neoprene

WHITTAKER
ESTABLISHED 1890

These three types of calcined magnesia meet requirements of quality and cost:

- **LIGHT**—The highest type. For the most exacting compounds. Fine particle size. Low moisture and carbonate content.
- **MEDIUM**—For less exacting requirements and where costs must be kept down. Fine particle size and low moisture content.
- **HEAVY**—Meets low cost need where high type compounding is not essential.

Samples, prices and additional information on request

WHITTAKER, CLARK & DANIELS, Inc.

260 West Broadway, New York City · Plant, South Kearney, N. J.

SALES REPRESENTATIVES

Chicago: Harry Holland & Sons
Philadelphia: Peltz & Company
Toronto: Richardson Agencies, Ltd.
Cleveland: Palmer Schuster Company

3343

Testing puts you "on the target"

Aim straight for desired results, by checking with *Scott Testers your major steps in purchasing and production. 60 models for tensile, hysteresis, burst, compression-cutting, flexing, adhesion, state-of-cure, plasticity, resistance to light aging, etc.

SCOTT TESTERS

* Registered Trademark

HENRY L. SCOTT CO. 85 Blackstone St. Providence, R. I.

RMP ANTIMONY

• ATTRACTIVE
• NON-DETERIORATING

for RED RUBBER

RARE METAL PRODUCTS CO. BELLEVILLE, N. J.

ERNEST JACOBY & CO.

Crude Rubber *Liquid Latex*
Crown Rubber Clay *Carbon Black*
Rubber Chemicals *Rubber Colors*

Stocks of above carried at all times

BOSTON - 79 Milk St. - MASS.

Cable Address: Jacobite Boston

The CARTER BELL MFG CO

CARTER BELL 1903 RUBBER SUBSTITUTES

Springfield New Jersey

REVIEWS (CONT'D)

GR-S (Buna S) Compounding. Rubber Service Department. Monsanto Chemical Co., Second National Building, Akron, Ohio. 8½ by 11 in. 119 pp.

The results of forty-two separate and distinct laboratory tests conducted by the company's technical staff on the problem of GR-S (Buna S) compounding are given in this mimeographed report. Considerable emphasis has been placed on the oven aging of these compounds, since Monsanto chemists believe that an aging period of 24 hours at 90° C. or 100° C. affords a fairly rapid indication of the embrittlement tendency of such compounds. Variations in Buna S so far supplied and the fact that it is quite sensitive to small changes in curatives make it very difficult to recommend exact amounts of sulfur, accelerator and some of the other compounding ingredients, and therefore the suggestion is made that each of the reports furnished be reviewed independently and that comparisons not be made from one to another. The influence of Accelerator A-10 on aged elongation as shown in certain of the reports is said to be quite interesting and the opinion is offered that this accelerator may offer a means of minimizing the effect of aging. The forty-two tests covered a wide range of subjects from various methods of milling Buna S tread to the resistance of Buna S to heat. This is one of the most complete reports on GR-S compounding made available to date.

•

1943 Yearbook of the Los Angeles Rubber Group. Published by the Group (Secretary, Charles M. Reinke, Reinke-Hiller and Amende, 1925 East Olympic Blvd., Los Angeles, California). 8½ x 11 in. 16 pp.

In addition to containing the complete membership, and lists of rubber manufacturers on the Pacific Coast and suppliers to the industry located in Los Angeles, Long Beach and San Francisco, this latest year book of the Los Angeles Rubber Group, which is dedicated to members of the group now serving in the armed forces, has been expanded to contain tit-bits on meetings held during the previous year, presented in chronological order. A brief description, accompanied by some photographs, of the indoor outing held last summer is also included. Photographs of the present officers are reproduced. The current edition is a big improvement over the previous one, the first to be published.

•

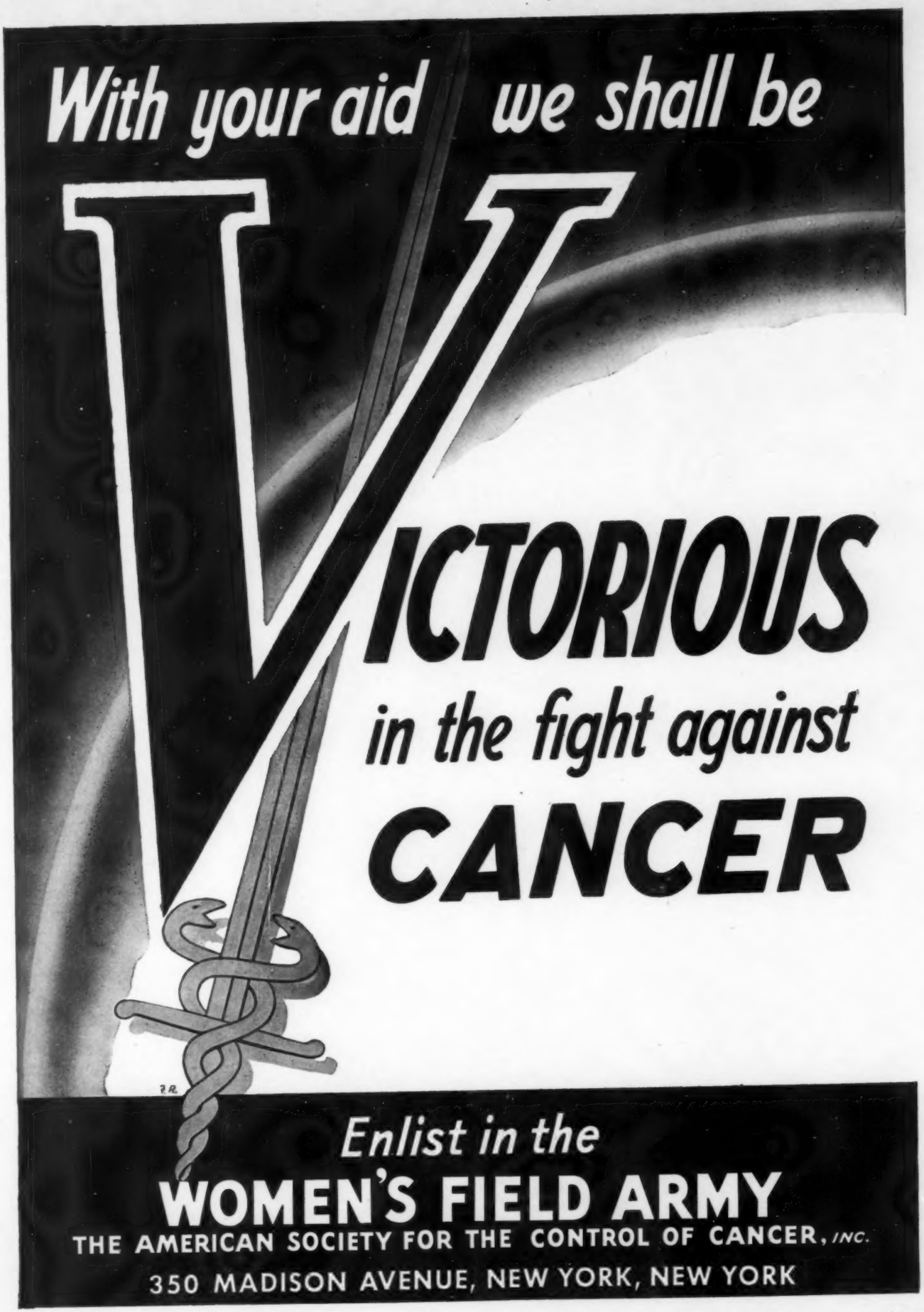
Surgical Trade Buyer's Guide—1943. Published by Surgical Business, Inc., 369 Lexington Ave., New York, N. Y. 6 by 9 in. 116 pp. $1.00.

This latest edition of the buyer's guide for surgical supply, hospital supply, and orthopedic appliance dealers, the fourth annual issue, has been completely revised and brought up-to-date. It is again divided into two sections, the first devoted to an alphabetical listing of surgical supplies and their manufacturers, and the second, treated in the same manner, to orthopedic appliances. The Surgical Supply Section lists sources of supply for ampouled medications, furniture and equipment, low voltage apparatus, short wave apparatus, surgical dressing, surgical instruments, surgical supplies, therapeutic equipment, and X-ray equipment. A number of rubber products are of course included.

•

Special Coatings and Cements for War Industries. Union Bay State Co., 50 Harvard St., Cambridge, Mass, 3¾ x 8¼ in.

A number of special coatings and cements compounded by the company for use by various types of war plants are described in this booklet. Included are cements for inflatable boats and pontoons, barrage balloons, double texture garments, gaskets, engine mountings, and rubber mats applied to steel decks. All of the adhesives and coatings described are reported to have been tested for actual production requirements and to have met the necessary contract specifications.


With your aid we shall be
VICTORIOUS
in the fight against
CANCER
Enlist in the
WOMEN'S FIELD ARMY
THE AMERICAN SOCIETY FOR THE CONTROL OF CANCER, INC.
350 MADISON AVENUE, NEW YORK, NEW YORK

MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, MARCH 13, 1943

Crude Rubber

THE price of crude rubber sold by the Rubber Reserve Company is being increased as of April 1. The new selling prices will be based on 40 cents per pound for 1X ribbed smoked sheet for all uses other than civilian goods. A complete new price schedule will be issued by Rubber Reserve shortly. At the same time the rise in price of crude rubber for all uses other than civilian goods was announced, an announcement was also made reducing the price of synthetic rubbers manufactured in Government-owned plants.

In accordance with Circular No. 16, issued by Rubber Reserve on February 12, all requests by manufacturers for the issuance of permits authorizing the purchase of crude rubber, liquid latex and balata are to be addressed to the Office of the Rubber Director rather than to Rubber Reserve as has been the custom heretofore. All requests must be in the Rubber Director's office prior to the 15th day of the month preceding the month during which delivery is desired. For the present, there will be no change in the existing method of distributing the rubber, latex or balata, and the activities of the Distributing Agent in New York City and the Liquid Latex Agents of Rubber Reserve will not be affected by the new procedure.

In furtherance of the policy of the Office of the Rubber Director and of the Rubber Reserve Co. to provide rubber manufacturers with an opportunity to become familiar with the use of guayule as a substitute for other types of rubber, it has been announced that an amount up to 25 pounds of guayule will be made available to any processor who desires to experiment with this material in the manufacture of items for which crude rubber may be consumed under the provisions of Supplementary Order M-15-b, as Amended. Applications for such purpose should be fiied with the Office of the Rubber Director on Form PD-500-B.

Prices shown below are those set by the Rubber Reserve Company:

(As of March 13, 1943)

Plantations—

Ribbed Smoked Sheets—			
No. 1 Spot	—	@	.22½
No. 2	—	@	.22¼
No. 3	—	@	.22
No. 4	—	@	.21¾
Thin Latex Crepe	—	@	.23 5/8
Thick Latex Crepe	—	@	.23 1/8
Brown Crepe, No. 1	—	@	.21⅝
Brown Crepe, No. 2	—	@	.21 1/8
Amber Crepe, No. 2	—	@	.21⅝
Amber Crepe, No. 3	—	@	.21 1/8
Brown Crepe, Rolled	—	@	.17 1/8

Latex—

Normal, carload lots, tanks	—	@	.2595
Normal, carload lots, drums	—	@	.2825
Conc., carload lots, tanks	—	@	.2765
Conc., carload lots, drums	—	@	.2950

Guayule—

Regular	.17½	@	.18
Ampar	—	@	.28

Paras—

Up-River, fine	—	@	—
Acre Bolivian, fine	—	@	—

Balata—

Surinam Sheet	—	@	.42½
Manaos Block	—	@	.38¾
Peruvian Prime	—	@	.38¾
Venezuelan Block	—	@	.40¼

Scrap Rubber

Scrap continues to flow in satisfactory amounts to agents of the Rubber Reserve Company, recent amounts having been swelled by the thousands of unusable tires collected during the operation of the Idle Tire Purchase Plan. It is now believed that there is sufficient scrap on hand to supply all existing reclaim facilities for the next 18 to 24 months. Although prices on synthetic rubber have been reduced and those on natural rubber have been increased, present prices on scrap rubber sold by the Rubber Reserve Co. will continue until at least July 1, 1943, according to a recent announcement. Prices shown below are those currently in effect on typical grades of scrap:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$18.00
Beadless truck tires	ton	24.00
Mixed truck tires	ton	18.00
Beadless passenger tires	ton	24.00
No. 1 passenger peelings	ton	47.50
No. 1 truck peelings	ton	47.50
No. 2 passenger tubes	lb.	.07¾
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06¾
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.05¼
Buffings	ton	35.00
Bicycle tires	ton	15.00
Air bags and water bags	ton	15.00
Boots and shoes	ton	33.00
Black mechanical scrap, above 1.10	ton	20.00

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½	@	.44
Peeler, carded, 23/4/3	lb.	.44½	@	.45
Peeler, carded, 15/3/3	lb.	.41½	@	.42
Peeler, carded, 15/4/2	lb.	.41½	@	.42
Peeler, carded, 13/3/3	lb.	.40½	@	.41
CHAFERS				
Carded, American, 1 1/8"	lb.	.43½	@	.44
Carded, American, 1"	lb.	.39½	@	.48

Sheetings

48x40	36 in.	5.50	lb.	—	@	7.818
40x40	36 in.	6.15	lb.	—	@	6.991
40x36	36 in.	6.50	lb.	—	@	6.615
48x48	40 in.	2.50	lb.	—	@	16.200
48x48	40 in.	2.85	lb.	—	@	14.210
56x60	40 in.	3.60	lb.	—	@	11.944
48x44	40 in.	3.75	lb.	—	@	11.066

Note: Prices shown above are ceiling prices set by order of the O.P.A. Quotations are based on an average price of 15-16-inch middling cotton of 20.37c at the ten designated southern markets.

Cotton

The price of middling uplands on the Cotton Exchange has swung in the relatively narrow range of 62 points since our last report, high for the period being 22.05, reached on February 27 and again on March 9, and low 21.43 on February 15. The average price of middling uplands for the month of February was 21.61, based on twenty-two trading days. The price rose steadily in mid-February, considerably aided by spontaneous bursts of trade buying, and there was little hedging witnessed in the market. Trade interests are keeping a sharp ear tuned for Washington developments, particularly where the Administration's fight for a one hundred million dollar fund to be used for incentive payments to farmers is concerned. A subcommittee of the House Appropriations Committee voted 6 to 1 against this fund on March 16. According to the latest estimate of the *Journal of Commerce*, cotton growers intend to plant 22,938,000 acres to cotton this year, against the estimate of 22,678,000 acres reported in the previous month. There were 23,310,000 acres in cultivation on July 1, 1942. Quotations for middling uplands on the Exchange follow:

	Feb. 13	March 13		
	Close	High	Low	Close
March	19.77	20.46	20.29	20.46
July	19.31	20.01	19.83	20.00
October	19.17	19.76	19.61	19.71

Reclaimed Rubber

It is evident from the tone of the second progress report made by Rubber Director Jeffers that reclaimed rubber will be expected to fill in any gap provided in the overall supply of rubber because of the curtailment of the synthetic rubber program occasioned by the lack of sufficient components to meet all military programs. In view of this situation, reclaimers are continuing to make every effort to expand productive capacity but no solution has yet been found to the manpower problem. In the meantime, the demand for reclaim continues at a relatively high level, with no lags foreseen for the immediate future. Prices shown below are ceilings on typical grades of reclaim:

Shoe

Unwashed	lb.	.07	@	.07¼

Tube

Black Tube	lb.	.11¼	@	.11½
Red Tube	lb.	.12	@	.12¼

Tires

Black (acid process)	lb.	.07½	@	.07¾
Black, selected tires	lb	.06½	@	.06¾
Truck, Heavy Gravity	lb.	.08½	@	.08¾

Miscellaneous

Mechanical blends	lb.	.04½	@	.05½
White	lb.	.13	@	.13¼

Ducks

Enameling (single filling)	lb.	—	@	.44¼
Belting and Hose	lb.	—	@	.39
Single filling, A grade	lb.	—	@	.19¾
Double filling, A grade	lb.	—	@	.20¾

CHEMICAL MARKETS

New York, Mar. 13, 1943
All Prices F.O.B. Works

ACCELERATORS

Organic			
A-1 (Thiocarbanilid)	lb.	.28 @	.33
A-10	lb.	.36 @	42
A-11	lb.	.52 @	.65
A-19	lb.	.52 @	.65
A-32	lb.	.60 @	.70
A-77	lb.	.42 @	.55
A-100	lb.	.42 @	.55
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.	.43 @	.45
Beutene	lb.	.59 @	.64
B-J-F	lb.	.38 @	.43
Butyl Zimate	lb.	— @	1.13
Captax	lb.	.38 @	.40
Crylene	lb.	.40 @	.47
Di-Ortho-Tolyguanidine	lb.	.44 @	.46
Diphenylguanidine	lb.	.35 @	.36
El-Sixty	lb.	.40 @	.47
Ethyl Zimate	lb.	— @	1.13
Ethylidine aniline	lb.	.42 @	.43
Formaldehyde aniline	lb.	.31 @	—
Guantal	lb.	.40 @	.50
Hepteen	lb.	.34 @	.39
Hexamethylenetetramine	lb.	.33 @	—
Lead Oleate, No. 999	lb.	.13 @	—
Witco	lb.	.15 @	—
Ledate	lb.	— @	1.48
Methyl Tuads	lb.	— @	1.53
Methyl Zimate	lb.	— @	1.23
Monex	lb.	— @	1.53
Pentex	lb.	.74 @	.84
Phenex	lb.	.50 @	.55
Pip-Pip	lb.	— @	1.65
R & R 50-D	lb.	.42 @	.43
R-2	lb.	1.40 @	1.80
R-2 Crystals	lb.	1.55 @	1.70
Rotax	lb.	.48 @	.50
Safex	lb.	1.15 @	1.25
Selenac	lb.	— @	1.25
SPDX	lb.	.70 @	.75
Super-Sulfur No. 2	lb.	.13 @	.15
Thiocarbanilid, drums	lb.	.28 @	.33
Thiurad	lb.	— @	1.55
Trimene	lb.	.54 @	.64
base	lb.	1.03 @	1.18
Triphenylguanidine	lb.	.45 @	—
Ulto	lb.	1.25 @	1.75
Ureka	lb.	.50 @	.75
Blend B	lb.	.50 @	.57
Blend C	lb.	.48 @	.55
Vulcanex	lb.	.42 @	.43
Vulcanol	lb.	.85 @	—
Inorganic			
Litharge, domestic	lb.	.07 @	.07½
Magnesia, calcined, heavy	lb.	.04 @	—

COLORS

Blacks (See Next Column)			
Blues [b]			
Prussian	lb.	.36 @	—
Ultramarine	lb.	.17 @	.27
Browns [b]			
Mapico	lb.	.1135 @	—
Umber, Turkey	lb.	.04¾ @	—
Greens [b]			
Chrome	lb.	— @	.25
Guignet's Green	lb.	.70 @	—
Reds			
Antimony			
crimson, 15/17	lb.	— @	—
sulfur, free	lb.	— @	—
Indian	lb.	.08¾ @	—
Domestic (Maroon)	lb.	.11 @	—
Mapico	lb.	.096 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red	lb.	.09¾ @	—
Whites [b]			
Cryptone No. 19	lb.	.0560 @	.0585
Cryptone CB No. 21	lb.	.0560 @	.0585
Cryptone ZS-800	lb.	.0825 @	.0850
Lithopone:			
Albalith	lb.	.04¼ @	.04½
Astrolith	lb.	.04¼ @	.04½
Azolith	lb.	.04¾ @	.04½
Ray-cal	lb.	.05½ @	.05¾
Rayox	lb.	.14½ @	.15¾
Titanox A	lb.	.14½ @	.14¾
Titanox B	lb.	.05¾ @	.06
Titanox C	lb.	.05½ @	.05¾
Zinc Oxide—American Process [b]			
American Azo:			
ZZZ (lead free)	lb.	.07¼ @	.07½
Anaconda, lead free	lb.	.07¼ @	.07½
Horsehead Lead Free Brand:			
Special—3	lb.	.07¼ @	.07½
XX Red—4	lb.	.07¼ @	.07½
XX Red—72	lb.	.07¼ @	.07½
XX Red—103	lb.	.07¼ @	.07½
Kadox, black label—15	lb.	.07¼ @	.07½
Red label—17	lb.	.07¼ @	.07½
St. Joe, black label	lb.	.07¼ @	.07½
green label	lb.	.07¼ @	.07½
red label	lb.	.07¼ @	.07½
U. S. P.—7, bbls.	lb.	.10½ @	.10¾
Zinc Oxide—French Process: [b]			
Florence White Seal—7 bbl.	lb.	.09½ @	.09¾
Green seal—8	lb.	.09 @	.09¼
Red seal—9	lb.	.08½ @	.08¾
Yellows [b]			
Cadmolith	lb.	.55 @	.60
Chrome	lb.	— @	.50
Mapico	lb.	.071 @	—

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

BLACKS
(In bags, carload lots)

Aerfloted Arrow		.0355 @	—
Certified		.0355 @	—
Certified Spheron		.0355 @	—
Channel "S"		.12 @	—
Continental		.0355 @	—
Disperso		.0355 @	—
Dixiedensed		.0355 @	—
Dixiedensed 66		.0355 @	—
Excello		.0355 @	—
Furnex		.03½ @	.06
Furnex Beads		.03½ @	.06
Gastex		.03½ @	.06
Kosmobile		.0355 @	—
Kosmobile 66		.0355 @	—
Kosmos-Dixie 20	lb.	.03½ @	.06
Micronex (Amarillo)		.0355 @	—
Micronex Beads (Amarillo)		.0355 @	—
Pelletex		.03½ @	.06
P-33		.0475 @	—
Shell Carbon (Del. Midwest)		.025 @	—
Sterling		.035 @	—
Supreme		.0355 @	—
Thermax		.0225 @	—
Thermax "S"		.0675 @	—
Wyex		.0355 @	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	18.00 @	24.50
99½%-300	ton	— @	16.50
86-90%-300	ton	— @	13.50
Asbestine	ton	16.50 @	20.00
Barium carbonate (98-100%)	ton	47.00 @	49.00
Barytes	ton	25.35 @	36.00
Bentonite	ton	11.00 @	16.00
Blanc fixe, dry	ton	60.00 @	67.50
Calcene	ton	37.50 @	43.00
Catalpo (fact)	lb.	.02 @	—
Chalk, precipitated			
Suprex white	ton	32.50 @	45.00
Clay, Aerfloted, Suprex	ton	10.00 @	22.50
Aerfloted Paragon	ton	10.00 @	22.50
Crown (f.o.b. plant)	ton	11.00 @	—
Dixie	ton	— @	10.00
Langford	ton	— @	8.50
McNamee	ton	— @	10.00
Par	ton	— @	10.00
Witco	ton	10.00 @	—
Cotton Flock (Dark)	lb.	.10½ @	.13
Kalite No. 1	ton	— @	26.00
Kalite No. 3	ton	— @	36.00
Kalvan	ton	— @	100.00
Kalvan "S"	lb.	— @	.09½
Magnesium carbonate	lb.	.06¼ @	—
Mica	ton	35.00 @	44.00
Mineralite	ton	— @	30.00
Pyrax A	ton	— @	7.50
Rottenstone (powd. Dom.)	ton	25.50 @	37.50
Rubberol	lb.	— @	.17½
Silene (calcium silicate)	lb.	.04 @	.045
Starch, powdered	cwt.	2.90 @	4.10
Talc, domestic	ton	17.00 @	25.00
Whiting, commercial	ton	16.00 @	26.00
Columbia Filler	ton	9.00 @	14.00
Witco	ton	6.00 @	—
Wood Flour (100 mesh)	ton	30.00 @	32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	25.00 @	—
Black Diamond	ton	25.00 @	—
Hard Hydrocarbon	ton	25.00 @	27.00
MilliMar	lb.	— @	.05½
Parmr, solid	ton	— @	—
Pioneer, MR, solid	ton	— @	—

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00 @	4.50
Rodo #10	lb.	5.00 @	5.50
Curodex 19	lb.	2.75 @	—
Curodex 188	lb.	3.50 @	—
Curodex 198	lb.	4.50 @	—
Para-Dors	lb.	4.50 @	—
Aresklene No. 375	lb.	.35 @	.50
Darvan (dispersing agent)	lb.	.30 @	.34
Santomerse S	lb.	.11 @	.25
Sponge Paste	lb.	— @	.18
Sunproof	lb.	.22¾ @	.27¾
Tackol (tackifier)	lb.	.085 @	.18
Tonox	lb.	.50 @	.59
Ty-Ply	gal.	6.75 @	8.00
Unicel (blowing agent)	lb.	.50 @	—

SOFTENERS

Acids			
Acetic, 28%, bbls. [a]	100 lb.	3.38 @	3.63
Nitric, 36 degrees	cwt.	5.00 @	—
Acids, Fatty			
Laurex	lb.	.14¾ @	.17¼
SL #10	lb.	.12 @	.14
Stearex Beads	lb.	.10 @	.11
Stearite	lb.	.10 @	—
Alkalies			
Caustic Soda, 76%	cwt.	2.70 @	5.70
Soda Ash, 58%	cwt.	1.15 @	2.98
Oils			
Cycline Oil	gal.	.14 @	.20
Degras, bbls.	lb.	.11 @	.12½
Para-Flux	gal.	.17 @	.18
Para-Lube	lb.	.046 @	.048
Petrolatum, amber [b]	lb.	.03¼ @	.04½
Pigmentaroil, tank cars	gal.	.20½ @	—
in drums	gal.	.26½ @	.27½
Pine, tanks	gal.	.55 @	—
Rosin Oil, cmpd.	gal.	.40 @	—
Rubberol	lb.	.13½ @	.14
Rubtack	lb.	.10 @	—
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	— @	—
Witco Softener No. 20	gal.	.20 @	—
Woburn No. 8, c.l.	lb.	.06 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06 @	—
coal tar	ton	19.00 @	22.00
hardwood	ton	16.00 @	22.50
pine, 200 lb. gr. wt.	bbl.	— @	4.50
Pigmentar, tank cars	gal.	.20½ @	—
in drums	gal.	.26½ @	.27½
Retort Pine Tar, drums	gal.	.26½ @	.27½
Solvents			
Acetone, pure [a]	lb.	.07 @	—
Benzene, 90%, tank car	gal.	.14 @	—
Beta-Trichlorethane	gal.	— @	.20
Bondogen	lb.	.98 @	1.05
Carbon, bisulfide	lb.	.05 @	.08½
Carbon tetrachloride	gal.	.73 @	1.27
Dichlorethylene	lb.	— @	—
Dipentene, cml., drums	gal.	.48 @	.50
Ethylene dichloride	lb.	.07½ @	.08½
Plastogen	lb.	.07¾ @	.08
Reogen (drums)	lb.	.11½ @	.12
Rub-Sol	gal.	.09½ @	—
Trichlorethylene	lb.	.08 @	.09½
Turpentine, spirits	lb.	.78½ @	—
dest. dist., drums	gal.	.50 @	.55
Waxes			
Beeswax, white [b]	lb.	.61 @	—
Carnauba, yellow [b]	lb.	.87 @	.89
Ceresin, white, dom.	lb.	.13½ @	.15
Montan, crude	lb.	.45 @	.46
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04½ @	—
Refined, 123/125	lb.	.05¼ @	—

ANTI-OXIDANTS

Agerite Alba	lb.	1.95 @	2.05
Gel	lb.	.52 @	.54
Hipar	lb.	.61 @	.63
Powder	lb.	.43 @	.45
Resin	lb.	.43 @	.45
Resin D	lb.	.43 @	.45
White	lb.	1.23 @	1.33
Albasan	lb.	.69 @	.74
Antox	lb.	.54 @	.56
B-L-E	lb.	.43 @	.52
Flectol H	lb.	.52 @	.65
Flectol White	lb.	.90 @	1.15
Neozone A, B, C, D, E	lb.	.43 @	.63
Oxynone	lb.	.77 @	.90
Retardex	lb.	.45 @	.48
Santoflex B	lb.	.52 @	.65
Santovar A	lb.	1.15 @	1.40
S.C.R.	lb.	.33 @	.35
Stabilite	lb.	.52 @	.54
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.43 @	.52

EXTENDERS

Naftolen	lb.	.15 @	.25
Vanzak	gal.	.05 @	.06

LUBRICANTS—MOLD & RUBBER SURFACE

Aresklene	lb.	.35 @	.50
Cocoa Soapstock	lb.	.06 @	.08
Colite	gal.	.90 @	1.15
Dipex	lb.	.06 @	.08
Glycerized Liquid Lubricant	gal.	— @	1.35
Lubrex	lb.	.25 @	.30
Mineralite	ton	— @	30.00
Mold Paste	lb.	.12 @	.18
Sericite	ton	65.00 @	75.00
Soap Tree Bark, cut, sifted	lb.	.06 @	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25 @	—
Amberex Type B	lb.	.18¾ @	—
Black	lb.	.08½ @	.13
White	lb.	.09 @	.15
Brown	lb.	.10 @	.14
Neophax A	lb.	.16½ @	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.08 @	.12
Sulfur Chloride, yellow (drs.)	lb.	.03 @	.08
Sulfur, rubber makers			
Refined (bags)	cwt.	2.55 @	—
Commercial (bags)	cwt.	2.20 @	—
Telloy	lb.	1.75 @	—
Vandex	lb.	1.75 @	—

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Industry.

The Market Place

If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Chemicals and Compounding Materials —

ACCELERATOR Z 51
- Good Aging Properties
- Free from Rapid Overcure
- Safe Processing Properties
- Low Dosages for Optimum Cures

Advance Solvents & Chem. Corp.
245 Fifth Ave. New York, N. Y.

CARBON BLACK-MICRONEX
The world's standard gas black; universally known as the "King of Rubber Pigments."
BINNEY & SMITH CO.
41 East 42nd St. New York City

CATALPO—The universal and standard rubber pigment now being used in treads, solids, tubes, carcass frictions, etc.
Moore & Munger
33 Rector Street New York City

ACCELERATORS—
El-Sixty; Ureka; Ureka C; Guantal; Santocure; DPG; Pip Pip; A-10; A-32; A-46; A-100; R-2 Crystals • ANTIOXIDANTS—Flectol H. White; Santoflex B, BX; Santovar A.
MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

CARBON BLACK
A Grade for Every Requirement
CONTINENTAL "AAA"—Low heat generating, extremely easy processing. "AA"—Low heat generating, easy processing. "A"—Medium cure, medium processing. "D"—Standard Channel Black.
Continental Carbon Company
295 Madison Ave., New York, N. Y.

CHEMICALS
Carbon Black—Clay—Colors
Accelerators—Sulphur
Stocks Carried At All Times
Ernest Jacoby & Co.
79 Milk St. Boston, Mass.
Cable Address: Jacobite Boston

AERO BRAND
RUBBER CHEMICALS
DPG—DOTG—Accelerator 49
Rubber Sulphur
American Cyanamid & Chemical Corporation
30 Rockefeller Plaza, New York, N. Y.

CARBON BLACK—Aerfloted
WYEX — TX — HX
Compressed — Compact (Dustless)
J. M. Huber, Inc.
460 West 34th St. New York

CHEMICALS

For Rubber		For Industry Generally
Accelerators	*Acids*	*Latex*
Antioxidants	*Oil of Myrbane*	*Lotol*
Specialties	*Aniline Oil*	*Dispersions*

NAUGATUCK CHEMICAL
Division of United States Rubber Co.
1230 SIXTH AVE. NEW YORK

ALUMINUM FLAKE
A uniform, fine, low gravity, white reinforcing pigment. *Furnished to the rubber trade for 40 years.*
The Aluminum Flake Co.
Akron, Ohio

CARBON BLACK
"Atlantic" Carbon Blacks meet the exacting standards of modern rubber production.
Chas. Eneu Johnson & Co., Mfrs.
Distributed by
C. P. HALL CO.
Akron — Boston — Los Angeles — Chicago

CHEMICALS
For Natural & Synthetic Rubber
"PICCO" Brand—Plasticizers; Coumarone Resins; Reclaiming Oils, Coal Tar Naphthas.
Pennsylvania Industrial Chem. Corp.
Clairton Penna.

ALUMINUM HYDRATES
"Alorco" Hydrated Aluminas reinforcing pigments give many desirable properties to rubber. Send for sample.
ALUMINUM CO. OF AMERICA
1970 Gulf Bldg. Pittsburgh, Pa.

CARBON BLACK
DIXIE...KOSMOS
Used throughout the world
UNITED CARBON COMPANY
Charleston, W. Va.
New York • Akron • Chicago

CHEMICALS
A complete line of plasticizers, resins, substitutes, fillers, etc., for Synthetic, Natural and Reclaimed Rubber.
STANDARD CHEMICAL COMPANY
Akron Savings & Loan Bldg, Akron

ANTIMONY Pentasulphide, golden and crimson, very fine, pure.
Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

CARBON BLACK
WITCO DISPERSO
and DUSTLESS and a
Complete Line of High Quality
Rubber Chemicals
Wishnick-Tumpeer, Inc.
295 Madison Ave., New York, N.Y.

CHEMICALS AND MINERAL
Ingredients—Whiting, Clay, Talc, Barytes, Colors. Heavy Calcined Magnesia. Carbonate of Magnesia, Pumice Stone.
Standard Since 1890
Whittaker, Clark & Daniels, Inc.
260 West Broadway New York

CALCENE—The Ideal low gravity, white reinforcing pigment. Gives high tensile and elongation properties with exceptionally good resistance to tear and abrasion.
PITTSBURGH PLATE GLASS CO.,
COLUMBIA CHEMICAL DIV.
Grant Bldg., Pittsburgh, Pa.

Do you believe in Your Products?
Then you should believe in telling the rubber industry about them. The MARKET PLACE is the logical place to display your wares.

COAL TAR CHEMICALS
Coumarone Resins Tack Producers
Resinous Oils Dispersing Oils
Reclaiming Oils Softeners
Solvents
The Neville Company
Neville Island, Pittsburgh, Penna.

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Chemicals and Compounding Materials (continued)

COLLOIDAL SULPHUR
COLLOIDAL ZINC OXIDE
COLLOIDAL COLORS
HEVEATEX CORPORATION
78 Goodyear Ave. Melrose, Mass.
Offices in New York, Akron, Chicago

FURNEX—FURNEX BEADS
The High Resilience
Semi-Reinforcing Black
BINNEY & SMITH CO.
41 East 42nd St. New York City

PARA-DORS—
overcome odors in rubber—effectively and at low cost.
GIVAUDAN-DELAWANNA, INC.
Industrial Aromatics Division
330 West 42nd St., New York, N. Y.

COLORS
BRILLIANT ORGANIC DYES; PERMANENT, NON-BLEEDING, LOW COST
For All Cures
MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

GASTEX
Special Process Reinforcing BLACK. Superior aging and oil resistant properties. Low permanent set.
Herron Bros. & Meyer, Akron, Ohio
General Sales Agents for
General Atlas Carbon Div.,
General Properties Co., Inc., Pampa, Texas

PARA-FLUX
The Universal Softener—Adaptable, Uniform. Improves Quality—Economical.
The C. P. Hall Co.
2510 First Central Tower
Akron Ohio

COMPOUNDING Materials
Vulcanizing Agents
Accelerators
Antioxidants
Plasticizers
Dispersions
Pigments
Clays
Mineral Rubber
Aromatics
Blacks
R. T. VANDERBILT CO.
230 Park Ave. New York City

IRON OXIDES
Asbestine—Barytes—Talc—
Soapstone
C. K. Williams & Co.
EASTON, PA.

PELLETEX (The pellet *Gastex*)
The special process reinforcing black in free-flowing form. Saves power; none wasted; protects adjacent colored stocks.
Herron Bros. & Meyer, Akron, Ohio
General Sales Agents for
General Atlas Carbon Div.,
General Properties Co., Inc., Pampa, Texas

CUMAR —Paracoumarone Resin.
A neutral gum for rubber compounding.
Samples and prices on request.
The Barrett Div.
Allied Chemical & Dye Corp.
40 Rector St. New York City

LAMP BLACKS
Produced according to the rigid specifications of the makers of EAGLE and OLD STANDARD Germantown Brands.
THE L. MARTIN COMPANY, Inc.
Unit of Columbian Carbon Co.
BINNEY & SMITH CO.
Distributor of Rubber Blacks
41 East 42nd Street New York, N. Y.

RUBBER PROCESSING OILS
For outstanding compatibility in processing natural or modern synthetic rubbers, use
SUN RUBBER PROCESSING OILS
Write
SUN OIL COMPANY
Philadelphia Pennsylvania

DU PONT Rubber Chemicals
DU PONT RUBBER COLORS
DU PONT ACCELERATORS
DU PONT ANTI-OXIDANTS
E. I. du Pont de Nemours & Co., Inc.
RUBBER CHEMICALS DIVISION
WILMINGTON, DELAWARE

MAGNESIUM OXIDE
Calcined Magnesium Oxide prepared for use in the compounding of neoprene. Full details on request.
J. T. Baker Chemical Co.
Phillipsburg New Jersey

RUBBER SUBSTITUTES
White, brown and black.
The Carter Bell Mfg. Co.
Springfield, New Jersey

EXTENDER
NAFTOLEN R 100 — Extender for Crude Rubber, Reclaim, Synthetics.
Wilmington Chemical Corporation
10 E. 40th St., New York, N. Y.

MAPICO COLORS
Pure Oxides of Iron
Yellows—Reds—Browns—Black
MAGNETIC PIGMENT CO.
Manufacturers
BINNEY & SMITH CO.
Distributors
41 East 42nd Street, New York, N. Y.

SOFTENERS
Rosin Oil — Pine Tar
Burgundy Pitch
"Galex" — a non-oxidizing Resin
National Rosin Oil & Size Co.
RKO Bldg. New York, N. Y.

"FACTICE"—Prevents blooming, makes colors fast and a smoother batch.
(Reg. U. S. Pat. Off.)
Stamford Rubber Supply Co.
Stamford, Conn.

MOLD LUBRICANT
"Orvus" enables articles to leave molds readily; molds clean easily. Effective in hardest water. Also acts as thorough cleanser for molded and extruded rubber goods.
PROCTER & GAMBLE
Cincinnati Ohio

SOLVENTS
"Skellysolve"—A superior solvent in six different types for various uses—for making rubber cements—for many different rubber fabricating operations.
SKELLY OIL CO., SOLVENTS DIV.
Skelly Bldg., Kansas City, Mo.

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Chemicals and Compounding Materials (continued)

STEARIC ACID
STEAREX . . . CAKE or POWDER
STEAREX BEADS
Standardized Products for Rubber Compounding
MINERAL RUBBER (Parmr), TALC
SOAPSTONE
BINNEY & SMITH CO.
41 East 42nd St. New York City

WAXES
Johnson's lustrous wax finishes retard oxidation, reduce friction, surface wear, tackiness.
S. C. JOHNSON & SON, INC.
Racine Wisc.

ZINC OXIDE PIGMENTS
The XX Reds Kadox
ZINC SULPHIDE PIGMENTS
The Cryptones The Albaliths (Lithoponse)
The New Jersey Zinc Sales Co.
New York Chicago
Cleveland, Boston, San Francisco

SULPHURS
Rubbermakers' TIRE BRAND and TUBE BRAND. Also CRYSTEX Insoluble Sulphur, Sulphur Chloride, Caustic Soda, Carbon Bi-Sulphide, Carbon Tetra-Chloride.
Stauffer Chemical Company
2710 Graybar Bldg., New York City

ZINC OXIDES
AZO ZZZ Zinc Oxides
lead free—pure—uniform—dependable
AZO ZZZ-11 AZO ZZZ-55
AZO ZZZ-22 AZO ZZZ-44 AZO ZZZ-66
American Zinc Sales Company
Columbus, Ohio New York
Chicago St. Louis

ZINC OXIDES
Black Label Red Label Green Label
Manufactured by Our New Electrothermic Process
St. Joseph Lead Co.
250 Park Ave.. New York
Plant and Laboratory: Monaca (Josephtown), Pa.

TITANIUM PIGMENTS
TITANOX
Unsurpassed in
OPACITY, WHITENESS, BRIGHTNESS
Titanium Pigment Corp., Sole Sales Agent, 111 Broadway, New York, N.Y.
104 South Michigan Ave., Chicago
350 Townsend Street, San Francisco
2472 Enterprise Street, Los Angeles

The Progressive Concern Selling to Rubber Manufacturers Uses THE MARKET PLACE for Results

ZINC STEARATE
ZINC LAURATE
Colite Mold Lubricant for Extra High Gloss
THE BEACON COMPANY
87 Bickford St., Boston, Mass.

Machinery and Equipment

BANBURYS REPAIRED
Re-building and re-surfacing rotors and mixing chambers has been our specialty for years.
INTERSTATE WELDING SERVICE
914 Miami St. Akron, Ohio

CUTTING MACHINERY
Specialists in Rubber Cutting Equipment for Bands, Crude Stock, Jar Rings, Tubes, Rollers, Washers, Treads, Cement Stock, etc.
See Black Rock for All Cutting Problems
Black Rock Manufacturing Co.
179 Osborne St. Bridgeport, Conn.

FORMS - PORCELAIN
Exclusive Manufacturers of Vitreous Porcelain Closed End Forms
No matter what shape or design—we can make it. Send blue print or sketch for our prices.
The Colonial Insulator Co.
936 Grant St. Akron, Ohio

CALENDER SHELLS
Gammeter's
ALL STEEL Calender Shells.
All welded. Any size.
New and better.
The W. F. GAMMETER CO.
Cadiz Ohio

DIAL GAUGES—Thickness
For measuring the thickness of rubber and similar materials. Many models.
Frank E. Randall
248 Ash St.,
Waltham Mass.

GRINDING MILLS
SPAN grinding mill reduces soft and hard rubber to fine powder.
Made in U. S. A.
M. Pancorbo
155 John St. New York, N. Y.

CUTTING DIES
Cutting and perforating dies of all types for rubber manufacturers.
Send for our quotations
Brockton Cutting Die & Machine Co.
Avon, Mass.

DRYING MACHINERY
For Synthetic Rubber, Reclaimed Rubber, Latex Processed Materials, etc.
PROCTOR & SCHWARTZ, INC.
Seventh St. & Tabor Rd. Philadelphia, Pa.

MACHINERY—RUBBER
"Master" Tube Molds, Tire Vulcanizers, Molds and Cores, Tire Drums, Tubers, etc.
Special Machinery Built to Order
Akron Standard Mold Co.
Akron, Ohio

CUTTING DIES
Also Tools, Dies, Jigs, Fixtures. Machine Parts and Special Machinery. Now engaged in Prime and Subcontract Work, Defense and Civilian.
Independent Die & Supply Co.,
LaSalle & Ohio Sts. St. Louis, Mo.

EXTRUDERS
The pioneer line of tubers, strainers and wire insulating machines. For latest developments inquire of
JOHN ROYLE & SONS
Paterson New Jersey

MACHINERY
L. ALBERT & SON
Trenton, N. J. Stoughton, Mass.
Los Angeles, Calif. Akron, O.

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Machinery and Equipment {continued}

MACHINERY
A complete service from the design of machinery to finished products of all kinds. Equipment for Plantations — also Reclaim, Latex and Rubber Plants.
Layouts — Formulas — Processes
Continental Machinery Company
305 BROADWAY, NEW YORK, N. Y.

MOLDS
For tires, rubber specialties and mechanical goods; general machine work.
The Akron Equipment Co.
Akron, Ohio

STOCK SHELLS
A Type for Every Need—Large Diameter—Light Weight — Extra Strong — Seamless.
National Sherardizing & Machine Co.
Hartford, Conn. Akron, Ohio

MACHINERY
Cutting, Trimming, Skiving, Cementing, Eyeletting, Cutting Dies—Eyelets.
United Shoe Machinery Corp.
140 Federal St., Boston, Mass.

Processing Equipment
For Reclaiming Rubber
Attrition Mills; Conveyors; Crushers; Cutters; Elevators; "Frigidisc" Grinders; Hammer Mills; Mixers, Sifters, etc.
ROBINSON MFG. CO.
30 Church St., New York, N. Y.

TESTING MACHINES
RUBBER TENSILE TEST MACHINES
TEXTILE TESTING MACHINES
Write for Descriptive Literature
Henry L. Scott Co.
P. O. Box 963 Providence, R. I.

MAGNETIC EQUIPMENT of All Kinds
Separators Drums
Clutches Brakes
Rolls Special Magnets
Stearns Magnetic Mfg. Co.
640 So. 28th St., Milwaukee, Wis.

RUBBER STRIP CUTTER
Strips slab rubber up to 1" thick, 10,000 feet in 8 hours. Any width. Tolerance 1/64 to 1/100 inch. No rejects. Write for full details.
Simplex Cloth Cutting Mach. Co.
270 W. 39th St., New York, N. Y.

USED MACHINERY
For Rubber & Allied Industries
Mills, Calenders, Hydraulic Presses, Tubers, Vulcanizers, Mixers, etc.
Eric Bonwitt
87 So. High St., Akron, Ohio

MANDRELS—All Types
Circular and Straight—Aluminum and Steel
Licensed Under Clyde E. Lowe Co. Patents
Sherardizing and Chrome Plating Machinery—Air Bag & Mandrel Polishing
National Sherardizing & Machine Co.
Hartford, Conn. Akron, Ohio

SPECIAL MACHINERY
For Quality and Efficiency in Working Rubber. Consult us about your problems.
Utility Manufacturing Co.
Cudahy, Wisconsin

WEATHERING UNIT
The National X-1-A Accelerated Weathering Unit quietly evaluates substitute materials, new formulas, established products.
NATIONAL CARBON CO., INC.
Carbon Sales Div.
Cleveland, Ohio

Rubber—Crude; Scrap; Latex; Dispersions

CRUDE RUBBER
BALATA—SYNTHETIC CHICLE
We handle Manufacturers' Crude Rubber and Balata Purchase Permits.
Charles F. Connor & Co., Inc.
110 State St. Boston, Mass.
Telephone: LAFayette 1202

DISPERSITE
Water Dispersed Rubber
(Reclaimed—Crude—Synthetics)
Man-made Alternate for Latex
Dispersions Process, Inc.
1230 Sixth Ave., New York, N. Y.
Offices in Detroit, Boston, Indianapolis

LOTOL
(Compounded Latex)
Ready to use
NAUGATUCK CHEMICAL
Division of United States Rubber Co.
Rockefeller Center, New York, N. Y.
Offices in Detroit, Boston, Indianapolis

CRUDE RUBBER
SCRAP RUBBER
Also **HARD RUBBER DUST**
H. Muehlstein & Co., Inc.,
122 E. 42nd St., New York City
BRANCHES: Akron, Chicago, Boston Detroit, Los Angeles, London, Paris

GUAYULE RUBBER
"AMPAR" BRAND
Washed and Dried
Continental Rubber Co. of N. Y.
745 Fifth Avenue New York

REVERTEX
Highly Concentrated (About 75%)
Rubber Latex
Sole Distributor for U. S. A. and Canada
Revertex Corp. of America
37-08 Northern Blv'd., L. I. City, N. Y.

CRUDE RUBBER
SCRAP RUBBER
HARD RUBBER DUST
BALATA — GUTTA PERCHA
Hermann Weber & Company
76 Beaver St. New York

LATEX
Normal, Concentrated, Processed
HEVEATEX CORPORATION
78 Goodyear Ave., Melrose, Mass.
Offices in New York, Akron, Chicago

RUBBER
Crude Rubber
Liquid Latex
Ernest Jacoby & Co.
79 Milk St. Boston, Mass.
Cable Address: Jacobite Boston

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Rubber [Cont'd]

RUBBER—
Scrap and Crude
Also HARD RUBBER DUST
A. Schulman, Inc.
Darrow Road, Akron, Ohio
1401 Mississippi Ave., E. St. Louis, Ill.
736 Statler Bldg., Boston, Mass.
Warehouses at Akron and E. St. Louis

VULTEX— THE ONLY VULCANIZED LATEX
Insures Highest Quality, Uniformity, Economy, Simplicity of Application.
FULLY PROTECTED BY PATENTS
Also Latex and Latex Compounds
General Latex & Chemical Corp.
Successors to the Vultex Chemical Company
666 Main St. Cambridge, Mass.

Reclaimed Rubber . . . .

NERVASTRAL
RECLAIMING PROCESSES
HIGH GRADE — HIGH SPEED
HIGH ECONOMY
Rubber & Plastics Compounds Co., Inc.
30 Rockefeller Plaza, New York, N. Y.
Tel: COlumbus 5-0085

RECLAIMED RUBBER—
For All Purposes
NAUGATUCK CHEMICAL
Division of United States Rubber Co.
1230 Sixth Ave., N. Y. City

RECLAIMED RUBBER—
Uniformity, reliability, cleanliness
PEQUANOC RUBBER CO.
Butler, N. J.

High Grade
RECLAIMED RUBBER
Southwest Rubber Reclaiming Corp.
22nd & No. Calhoun Sts.
Fort Worth, Texas

RECLAIMED RUBBER—
A standardized grade for every requirement.
U. S. Rubber Reclaiming Co., Inc.
500 Fifth Ave., New York, N. Y.
"60 Years Serving the Industry Solely as Reclaimers"

Rubber—Synthetic

HYCAR
For extreme resistance to heat, abrasion, oil, gasoline, aging, and deterioration.
HYCAR CHEMICAL COMPANY
335 South Main St.
Akron Ohio

NEOPRENE
In different types to meet stringent requirements.
The Neoprene Notebook carries up-to-date information on neoprene. Ask for it.
E. I. du Pont de Nemours & Co., Inc.
Rubber Chemicals Div.
Wilmington Del.

PERBUNAN
Oil Resistance—Heat Resistance
Long Life
Full information upon request.
STANCO DISTRIBUTORS, INC.
26 Broadway New York, N. Y.

THIOKOL
Synthetic rubber available in several types, including powder form. Excellent heat and solvent resistance.
THIOKOL CORPORATION
Trenton N. J.

YOUR PRODUCTS
Should be displayed in
THE MARKET PLACE
Show What You Have to Sell

Miscellaneous

Use the
MARKET PLACE
Section

To Display
Your Products
It Brings Results!

Fabrics—Liners, Hollands

CUSTOM FINISHERS of
RUBBER REPELLENT LINERS
Capitol Process Liner Treatment
—
Textile Proofers, Inc.
One Gates Ave. Jersey City, N. J.

LINERS TREATED
Advantages of Porotex Treatment
1. All Compounds stripped easily. 2. Wrinkles never cause liners to crack. 3. Prevents rot; liners rendered heat and oil-proof. 4. Liners remain porous, reducing tendency to trap air.
POROTEX PRODUCTS
875 East 140th St. Cleveland, Ohio

PROCESSED LINERS
"CLIMCO"—Fabrics treated to prevent adhesion of rubber stocks.
"LINERETTE"—Treated paper for separating or interleaving light weight rubber stocks.
The Cleveland Liner & Mfg. Co.
5508 Maurice Ave., Cleveland, Ohio

Consultants

CONSULTING
LATEX TECHNOLOGIST
—
R. J. Noble, Ph.D.
21 Woodland Road, Malden, Mass.

CONSULTING
Rubber Technologist
Natural and Synthetic Rubber
R. R. Olin Laboratories
P. O BOX 372 AKRON OHIO
Telephones: HE 3724, FR 8551

Rubber Mnfrs.

MECHANICAL MOLDED
RUBBER GOODS
Sponge Rubber: Sheeted—Die Cut—Molded
Your Inquiries Solicited
Barr Rubber Products Co.
Sandusky, Ohio

SANITARY GOODS—
Dress Shields, Baby Pants, Aprons, Elastic Belts, Bloomers, Stepins, Bibs, Guimps and Brassieres.
SPECIAL GOODS CUT TO ORDER
Rand Rubber Co., Inc.
Summer Ave. & Halsey St., Brooklyn, N. Y.

WANT ADS

RATES: Five cents per word, minimum charge $2.00, except POSITIONS WANTED, $1.00 for 40 words or less, extra three cents per word. All classified advertisements payable in advance. Address replies to box numbers care of RUBBER AGE, 250 West 57th St., New York.

POSITIONS WANTED

RUBBER CHEMIST—Five years varied experience with large company in rubber and synthetic mechanicals and miscellaneous compounding. Also experience with latex. Desires position with small progressive company. Married with two children. Salary $3600. Address Box 1325, RUBBER AGE.

MAN with long experience in tires, mechanicals, sundries, etc.; acknowledged expert on product development and all phases of manufacturing with crude, synthetics and reclaims. Over draft age; willing to go anywhere. Address Box 1330, RUBBER AGE.

RUBBER CHEMIST—12 years' experience, insulated wire and cables, coated fabrics and industrial products. Thorough background in compounding of synthetics. Technical education. Married, age 32. Draft 3B. Available on short notice. Prefer development but will consider production or sales service. Complete details on request. Address Box 1332, RUBBER AGE.

HELP WANTED

CHEMIST: for development work compounding in Mechanical Rubber Goods, both molded and extruded. Experience in rubber and synthetics desirable. Should have deferred classification. Position permanent. Factory located in Massachusetts. Address Box 1321, RUBBER AGE.

RESEARCH CHEMIST: For research on latex and synthetic rubber. Graduate study and some industrial experience desirable. Knowledge of colloid chemistry helpful. Plant in New England engaged in war work. Permanent position. Address Box 1322, RUBBER AGE.

CHEMIST WANTED by an old established mechanical rubber manufacturing plant located in Connecticut about 60 miles from New York City. Applicant must have had experience in rubber and synthetic rubber compounding. Please give full particulars in writing to Box 1323, RUBBER AGE.

MAINTENANCE ENGINEER with experience in rubber plant. Excellent opportunity for right man both now and after the war with established company in New England. Reply Box 1324, RUBBER AGE.

WANTED: RUBBER CHEMIST by a large organization to conduct research on organic and inorganic compounds in synthetic rubber. Knowledge of rubber compounding, organic and physical chemistry essential. New York area. State particulars including draft status. Address Box 1326, RUBBER AGE.

WANTED: By large supplier to rubber industry, a Technical Service man with organizational ability; must be experienced in natural and synthetic rubber, rubber and latex substitutes, etc. Wide acquaintance in rubber field desirable. Will also supervise other salesmen. Good salary to start. Send full details to Box 1328, RUBBER AGE.

CHEMIST and practical man knowledge of coating Nitro cellulose on cotton goods. Must have good references. Address Box 1329, RUBBER AGE.

CHEMIST—For research and development work on rubber bonded abrasive products. Experience in abrasives desirable but not essential. Bay State Abrasive Products Company, Westboro, Massachusetts.

WORKS MANAGER: Chemical and Engineering background. Experienced in modern methods of rubber products production other than tires or tubes. Must be thoroughly versed in costs, compounding, development of new products, etc., both special and mass production. Age 40-50. High salary commensurate with ability.

All negotiations confidential. Employer pays fee.

WILLIAM H. SHUMWAY, INC.
Personnel Counselors
176 Federal Street **Boston, Mass.**

EQUIPMENT FOR SALE

FOR SALE—One 6x6x12, belt driven, laboratory mill, complete with control and 7½ HP, 220 volt, 3 phase motor. Address Box 1327, RUBBER AGE.

FOR SALE: 1—Triplex Hydraulic Pump 2.85 g.p.m. at 3500 lb. pressure; 1—Hydro-accumulator 2500 PSI, 16½ gals. complete with tank, compressor and piping; 1—W.S. 15" x 18" Hydraulic Press, 10" dia. ram; 2—D. & B. 20½" x 20½" platens; 1—14" x 24" Press, 9" ram; 9—24" x 55" Steel Cored Heating Platens: 1—Farrel-Birmingham 15" x 36" Rubber Mill: 4—W. & P. Mixers; 1—Set of Compound Rolls 15" x 36"; Adamson 6" Tuber; Dry Mixers; Pulverizers, Grinders, etc. Send for complete list. CONSOLIDATED PRODUCTS COMPANY, INC., 14-19 Park Row, New York, N. Y.

EQUIPMENT WANTED

WANTED—Banbury Mixer, Mills, Calender, Hydraulic Presses with pump and accumulator, Tubers, any condition. Address Box 1331, RUBBER AGE.

WANTED
PAPER DRYER OR COMPLETE COATING MACHINE, ALSO OTHER EQUIPMENT

Used paper dryer or complete pyroxylin or similar paper coating machine up to 54" wide. Also 50-gal. and 300-500 gal. mixers, filter presses. Not a dealer. Write full details.

P.O. Box 270, Morristown, N. J.

BEACON
Zinc Stearate
Calcium Stearate
for the Rubber & Plastic Industry
THE BEACON COMPANY
97 Bickford St., Boston, Mass.
Colite—"The Mold Lubricant"

AIR BAG BUFFING MACHINERY
STOCK SHELLS HOSE POLES
MANDRELS
NATIONAL SHERARDIZING & MACHINE CO.
868 Windsor St. Hartford, Conn.
Representatives: Akron San Francisco New York

SINCE 1880 RUBBER GOODS
Rand REG. U. S. PAT. OFF.
"They Last Longer" REG. U. S. PAT. OFF.
DRESS SHIELDS
DRESS SHIELD LININGS
BABY PANTS
BABY BIBS & APRONS
SANITARY WEAR
RUBBERIZED SHEETING
RUBBER APRONS
STOCKINET SHEETS
RUBBER SHEETS
RAINCAPES & COATS
RUBBER SPECIALTIES
DOLL PANTS, CAPES, ETC.
RUBBER DAM & BANDAGES — SHEET GUM
RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

NEW & REBUILT MACHINERY
Equipped to Furnish Complete Plants
L. ALBERT & SON
OFFICES AND PLANTS
TRENTON, N. J. • AKRON, OHIO
LOS ANGELES, CALIF. • STOUGHTON, MASS.

Our Rebuilding Process Removes the Element of Risk by These Five Important Steps:
1. INSPECTED
2. DISASSEMBLED
3. REBUILT
4. MODERNIZED
5. GUARANTEED

Our New Machines:
MILLS
MIXERS
BRAKES
PRESSES
CUTTERS
SUSAN GRINDERS

INDEX TO ADVERTISERS

Advance Solvents & Chemical Corp. 530, 540
Akron Equipment Co. 543
Akron Standard Mold Co. 542
Albert & Son, L. 545, 542
Aluminum Co. of America 540
Aluminum Flake Co. 540
Aluminum Ore Co. 540
American Cyanamid & Chemical Corp. 470, 540
American Resinous Chemicals Corp. ..... Back Cover
American Zinc Sales Co. 464, 542

Baker Chemical Co., J. T. 525, 541
Barr Rubber Products Co. 544
Barrett Div., Allied Chemical & Dye Corp. 472, 541
Beacon Co. 545, 542
Binney & Smith Co. ..... Insert Following 512; 527, 540, 541, 542
Black Rock Mnfg. Co. 542
Bonwitt, Eric 543
Brockton Cutting Die & Machine Co. 542

Carter Bell Manufacturing Co., The 536, 541
CLASSIFIED ADVERTISING 545
Cleveland Liner & Mnfg. Co. 468, 544
Colonial Insulator Co. 542
Columbian Carbon Co. ..... Insert Following 512; 527, 541
Connor, Charles F., & Co., Inc. 543
Continental Carbon Co. 465, 540
Continental Machinery Co. 526, 543
Continental Rubber Co. 543

Dispersions Process, Inc. 543
Du Pont de Nemours & Co., E. I. ..... Inside Front Cover; 541, 544

Eastern Engineering Co. 532

Gammeter, W. F., Co. 534, 542
General Atlas Carbon Div. 478, 541
General Latex & Chemical Corp. 544
Givaudan-Delawanna, Inc. 541
Gordon-Lacey Chemical Products Co. 460

Hall Co., The C. P. 540, 541
Herron Bros. & Meyer 478, 541
Heveatex Corporation 525, 541, 543
Holliston Mills, Inc. ..... —
Huber, J. M., Inc. 540
Hycar Chemical Co. 459, 544

Interstate Welding Service 542
Independent Die & Supply Co. 527, 542

Jacoby, Ernest, & Co. 536, 540, 543
Johnson & Son, S. C., Inc. 531, 542

Loewenthal Co. ..... —

Magnetic Gauge Co. ..... —
Magnetic Pigment Co. 541
Martin, L., & Co., Inc. 527, 541
Monsanto Chemical Co. (R. S. Dept.) 541
Moore & Munger 540
Muehlstein & Co., H., Inc. 543

National Carbon Company, Inc., Carbon Sales Div. 543
National Rosin Oil & Size Co. 534, 541
National Rubber Machinery Co. 463
National Sherardizing and Machine Co. 545, 543
Naugatuck Chem. Div. U. S. Rubber Co. 482, 540, 543, 544
Neville Co. 531, 540
New Jersey Zinc Co. 545
Noble, R. J. 544

Olin Laboratories, The R. R. 544

Pancorbo, M. 542
Pennsylvania Industrial Chemical Corp. 540
Pequanoc Rubber Co. 544
Pittsburgh Plate Glass Co., Columbia Chemical Div. 540
Porotex Products 544
Procter & Gamble 526, 541
Proctor & Schwartz, Inc. 542

Rand Rubber Co. 545, 544
Randall, Frank E. 527, 542
Rare Metal Products Co. 536, 540
Reichold Chemicals, Inc. ..... —
Revertex Corp. of America 524, 543
Rhoades, R. W., Metaline Co., Inc. ..... —
Robinson Mfg. Co. 528, 543
Royle & Sons, John 479, 542
Rubber & Plastics Compounds Co., Inc. 544

St. Joseph Lead Co. 462, 542
Schulman, A., Inc. ..... Inside Back Cover, 544
Scott Co., Henry L. 536, 543
Simplex Cloth Cutting Machine Co., Inc. 525, 543
Skelly Oil Co., Solvents Div. 376
Stamford Rubber Supply Co. 546, 541
Stanco Distributors, Inc. 473, 544
Standard Chemical Co. 467, 540
Stauffer Chemical Co. 531, 542
Stearns Magnetic Mfg. Co. 543
Sun Oil Co. 480, 541

Textile Proofers, Inc. 469, 544
Thiokol Corp. 466, 544
Titanium Pigment Corp. 471, 542

Union Bay State Co. 524
Union Carbide and Carbon Corporation 543
United Carbon Co. ..... Insert Following 474; 540
United Shoe Machinery Corp. 535, 543
U. S. Rubber Co., Naugatuck Chemical Div. 482, 540, 543, 544
U. S. Rubber Reclaiming Co. 544
Utility Mfg. Co. 543

Vanderbilt, R. T., Co. ..... Front Cover, 541

Watson-Stillman Co. ..... —
Weber, Hermann, Co. 543
Whittaker, Clark & Daniels, Inc. 535, 540
Williams, C. K., & Co. 534, 541
Wilmington Chemical Corp. 461, 541
Wishnick-Tumpeer, Inc. 540

Stamford Neophax Vulcanized Oil

(REG. U. S. PAT. OFF.)

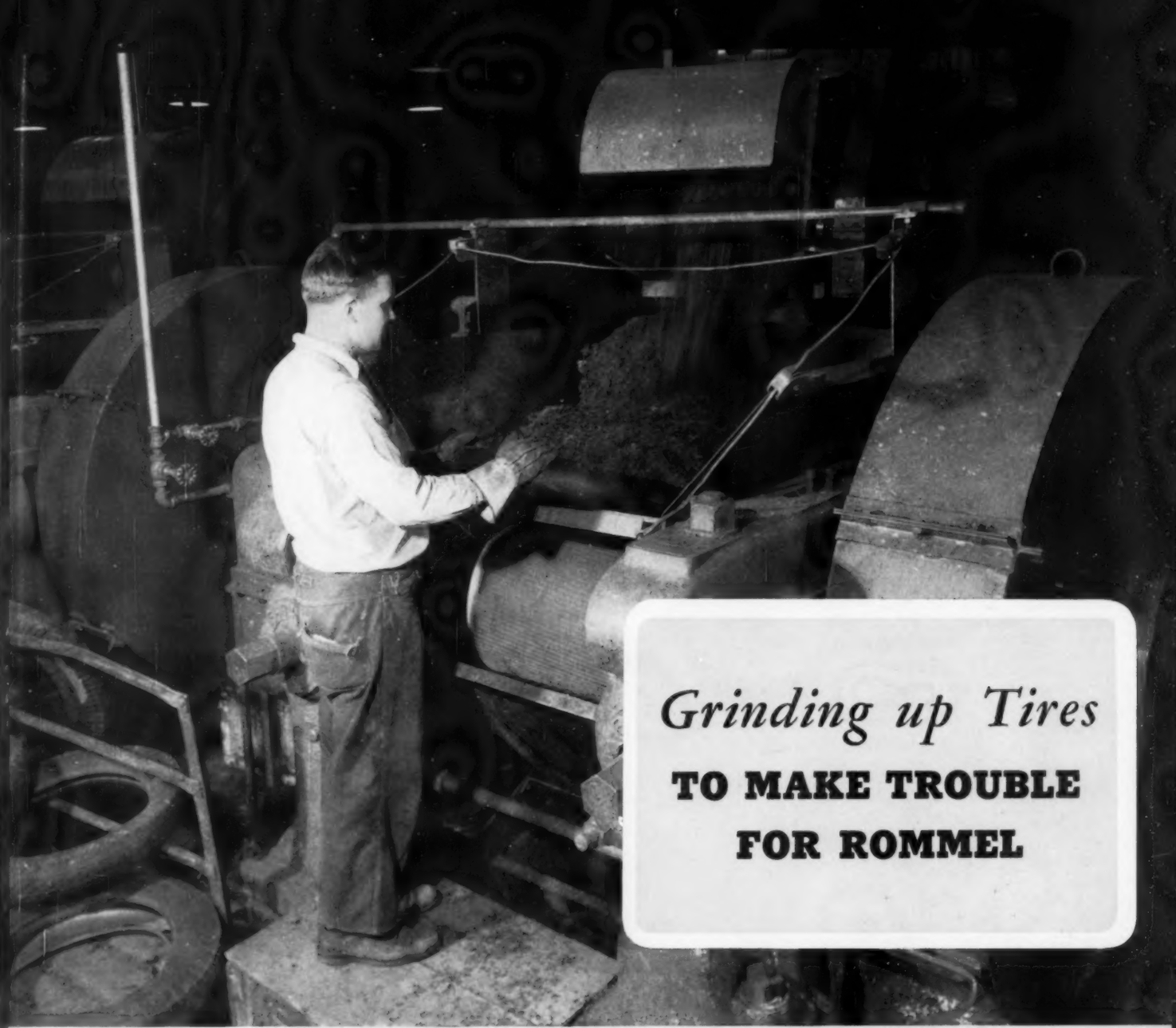
For Use With Neoprene

THE STAMFORD RUBBER SUPPLY CO. STAMFORD CONN.

Makers of Stamford "Factice" Vulcanized Oil Since 1900

(Reg. U. S. Pat. Off.)

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.



Grinding up Tires
TO MAKE TROUBLE FOR ROMMEL

Grinding up Scrap is the first operation in the making of reclaimed rubber, essential for tires to speed our war effort and fighting equipment to help smash the Axis.

What has gone before: Act One in the drama of "Reclaim for Victory" is played by the Scrap Rubber Organization. Old tires and tubes are gathered from every source, sorted into various grades, and delivered to the reclaimers. This work is mighty important in filling the gap created by Japanese seizure of our crude rubber supplies.

Let's all keep driving with the necessary SWEAT, SKILL and SPEED to do our part well.

A. SCHULMAN, Inc.

BUYING AGENT, RUBBER RESERVE COMPANY

Akron, Ohio
790 E. Tallmadge Ave.

East St. Louis, Ill.
14th & Converse Sts.

Boston, Mass.
738 Statler Bldg.

New York, N. Y.
500 Fifth Ave.

9 #5/21

VULPRENE

Replacement for Crude and Reclaimed Rubber

VULPRENE is the generic name for a series of long-chain polymers, similar to Norepol, and derived from fatty oils. They are available in various forms, from viscous through tough rubber-like vulcanizates, and are suitable as replacement materials for crude and reclaimed rubber in insulation, coating and molded goods where extreme flexibility, tensile and abrasion are not required. They can be compounded, milled and vulcanized in the usual manner.

Other Products for Use as Replacements, Modifiers and Extenders for Latex, Reclaims and Synthetics

RESIN AND LACQUER EMULSIONS—These emulsions are being used today as *Latex Modifiers* and *Complete Latex Replacements* to extend, thicken, stabilize, increase penetration, improve resistance to acids, oils and solvents; in *Coatings* to produce adherent pigmented or clear coatings on paper, fabric, and rubber and as intermediate coats for lacquer on rubberized cloth; in *Rubberizing* textiles; in *Latex Treated Papers* to increase strength and improve ageing; in *Adhesives,* for paper, for leather to cloth, and cloth to cloth.

VULPRENE SOLUTIONS AND DISPERSIONS. These forms of Vulprene are being used for adhesive tapes, marking papers, water-resistant coatings, etc. *Vulprene Latex* is used as a latex extender particularly as shoe adhesives, for impregnation of paper, can sealing compounds and coating materials.

ALKYD 18—an alkyd type resin emulsion which is non-yellowing and non-oxidizing. Film is water-white and non-tacky. Preferred where slight oxidizing action may be considered harmful to rubber. Extender for latex in coating, combining and impregnating process.

EMULSION 58-8—a series of emulsified elastomers containing up to 65% solids. Recommended for use as full latex replacements in impregnation and combining.

PIGMENT BASES—concentrated aqueous dispersions of pigments in resin bases, available in all shades and viscosities, suitable for spreading, spraying, etc.

Also Acrylic, Vinyl, Maleic, Phenolic, Hydrocarbon, Ethyl Cellulose, Cellulose Acetate and Nitrate emulsions and solutions for various applications.

WE'RE SORRY!—We have received so many inquiries in recent weeks for data and samples of our products that it has not always been possible to acknowledge them promptly. If you have not received a reply, please bear with us and we'll try to answer your request as soon as possible.

AMERICAN RESINOUS CHEMICALS CORPORATION

Rubber Substitutes • *Rubber Synthetics* • *Resin, Lacquer Emulsions*

MAIN OFFICE and LABORATORIES

PEABODY, MASS.

Factory Branches: Newark, N. J. and Chicago, Ill.